Vol. 1147 Number 1

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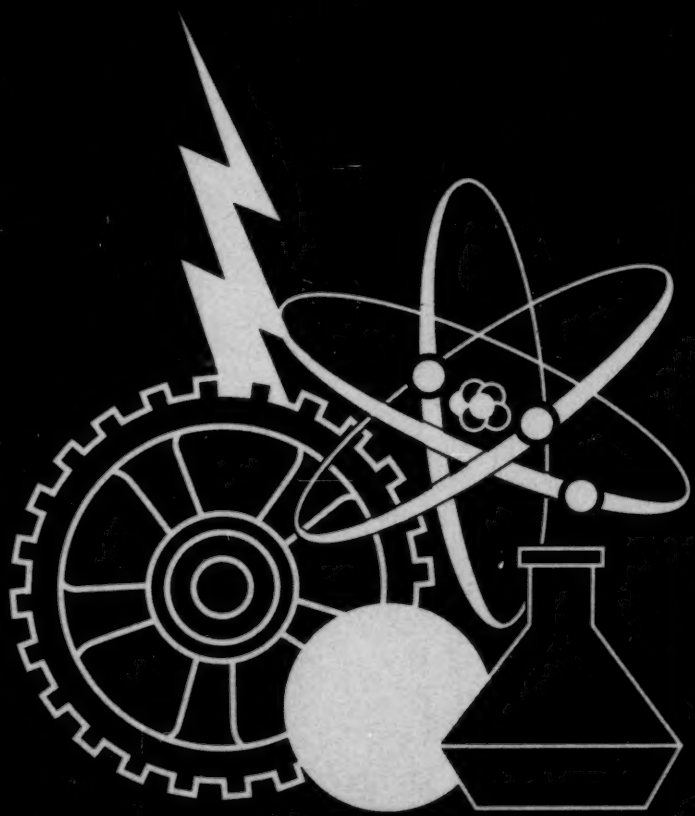
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

oute to:

PATENTS

February 2, 1993



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

February 2, 1993 Volume 1147 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1142 O.G. 66, on Sept. 29, 1992.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on Oct. 1, 1992, due to changes both in the amount of the international search fee charged by the European Patent Office and in the exchange rate of the U.S. dollar to the German mark, and was announced in the *Official Gazette* at 1142 O.G. 20, on Sept. 8, 1992.

International fees, effective on Dec. 1, 1992, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, were announced in the *Official Gazette* at 1143 O.G. 62, on Oct. 27, 1992.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Oct. 1, 1992 and were announced in the *Official Gazette* at 1141 O.G. 68 on Aug. 25, 1992.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	200.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	620.00
—Corresponding prior U.S. national application filed	410.00
—Supplemental search fee, per additional invention	170.00
European Patent Office as ISA	1635.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	450.00
—Additional examination fee, per additional invention	140.00
—ISA not the USPTO	670.00
—Additional examination fee, per additional invention	230.00
International fees	
Basic fee	593.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region for the first 10 national or regional offices	144.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	181.00

U.S. National Stage fees	Small Entity	Regular
USPTO was IPEA	320.00	640.00
USPTO was ISA but not IPEA	355.00	710.00
USPTO was neither ISA nor IPEA	475.00	950.00
Filing with an EPO or JPO search report	415.00	830.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	45.00	90.00
—For each independent claim in excess of 3	37.00	74.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	115.00	230.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Nov. 8, 1992

DOUGLAS B. COMER,
Acting Assistant Secretary and Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d) provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on January 30, 1990 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,896,375 through 4,897,884
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on January 28, 1986 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,566,136 through 4,567,610
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after December 12, 1980, but before August 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months and eleven years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1992, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 , in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9f) $465.00
By other than a small entity $930.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9f) $935.00
By other than a small entity $1,870.00

(g) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity(§ 1.9(f)) $1,410.00
By other than a small entity $2,820.00

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(h), and (i), which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980

By a small entity (§ 1.9f) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been

(1) unavoidable $620.00
(2) unintentional $1,500.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED NOVEMBER 22, 1992 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,483,020	06/442,304	11/20/84
4,483,022	06/388,189	11/20/84
4,483,026	06/401,546	11/20/84
4,483,027	06/387,972	11/20/84
4,483,028	06/477,507	11/20/84
4,483,031	06/488,366	11/20/84
4,483,033	06/451,982	11/20/84
4,483,036	06/560,750	11/20/84
4,483,037	06/443,334	11/20/84
4,483,038	06/530,781	11/20/84
4,483,039	06/537,427	11/20/84
4,483,041	06/431,051	11/20/84
4,483,042	06/420,809	11/20/84
4,483,045	06/622,389	11/20/84
4,483,047	06/443,210	11/20/84
4,483,050	06/412,212	11/20/84
4,483,052	06/305,303	11/20/84
4,483,056	06/397,836	11/20/84
4,483,057	06/335,826	11/20/84
4,483,058	06/471,868	11/20/84
4,483,059	06/486,565	11/20/84
4,483,063	06/383,617	11/20/84
4,483,067	06/416,791	11/20/84
4,483,068	06/324,896	11/20/84
4,483,071	06/363,762	11/20/84
4,483,073	06/402,925	11/20/84
4,483,074	06/414,336	11/20/84
4,483,076	06/445,405	11/20/84
4,483,077	06/504,868	11/20/84
4,483,078	06/418,445	11/20/84
4,483,079	06/448,337	11/20/84
4,483,080	06/361,835	11/20/84
4,483,082	06/367,426	11/20/84
4,483,084	06/386,694	11/20/84
4,483,085	06/559,103	11/20/84
4,483,086	06/397,107	11/20/84
4,483,087	06/337,445	11/20/84
4,483,088	06/462,231	11/20/84
4,483,089	06/399,205	11/20/84
4,483,090	06/437,498	11/20/84
4,483,091	06/460,904	11/20/84
4,483,093	06/453,144	11/20/84
4,483,095	06/597,649	11/20/84
4,483,096	06/476,006	11/20/84
4,483,097	06/379,621	11/20/84
4,483,099	06/597,691	11/20/84
4,483,102	06/422,459	11/20/84
4,483,104	06/363,520	11/20/84
4,483,105	06/474,472	11/20/84
4,483,108	06/417,127	11/20/84
4,483,112	06/329,710	11/20/84
4,483,114	06/373,391	11/20/84
4,483,115	06/367,446	11/20/84
4,483,118	06/224,677	11/20/84
4,483,119	06/507,700	11/20/84
4,483,121	06/509,375	11/20/84
4,483,122	06/311,822	11/20/84
4,483,126	06/349,517	11/20/84
4,483,127	06/388,178	11/20/84
4,483,129	06/426,151	11/20/84
4,483,131	06/453,435	11/20/84
4,483,132	06/465,982	11/20/84
4,483,135	06/547,770	11/20/84
4,483,136	06/583,231	11/20/84
4,483,139	06/441,100	11/20/84
4,483,140	06/290,015	11/20/84
4,483,143	06/423,528	11/20/84
4,483,145	06/335,248	11/20/84
4,483,146	06/500,512	11/20/84
4,483,152	06/515,216	11/20/84
4,483,153	06/484,394	11/20/84
4,483,154	06/483,855	11/20/84
4,483,155	06/392,617	11/20/84
4,483,157	06/564,840	11/20/84
4,483,158	06/575,753	11/20/84
4,483,159	06/377,013	11/20/84
4,483,161	06/336,041	11/20/84
4,483,162	06/376,258	11/20/84
4,483,163	06/395,490	11/20/84
4,483,164	06/570,992	11/20/84
4,483,166	06/413,336	11/20/84
4,483,171	06/451,158	11/20/84
4,483,173	06/360,842	11/20/84
4,483,174	06/566,060	11/20/84
4,483,175	06/450,698	11/20/84
4,483,178	06/458,913	11/20/84

Patent Number	Serial Number	Issue Date
4,483,179	06/326,524	11/20/84
4,483,182	06/348,116	11/20/84
4,483,183	06/384,815	11/20/84
4,483,188	06/470,020	11/20/84
4,483,189	06/518,336	11/20/84
4,483,192	06/361,513	11/20/84
4,483,197	06/430,535	11/20/84
4,483,198	06/455,673	11/20/84
4,483,199	06/421,115	11/20/84
4,483,200	06/422,975	11/20/84
4,483,201	06/404,550	11/20/84
4,483,203	06/500,495	11/20/84
4,483,206	06/443,408	11/20/84
4,483,208	06/394,505	11/20/84
4,483,209	06/438,801	11/20/84
4,483,214	06/477,121	11/20/84
4,483,222	06/297,495	11/20/84
4,483,223	06/482,721	11/20/84
4,483,224	06/502,152	11/20/84
4,483,225	06/450,360	11/20/84
4,483,227	06/393,042	11/20/84
4,483,232	06/535,028	11/20/84
4,483,233	06/431,395	11/20/84
4,483,237	06/493,289	11/20/84
4,483,238	06/432,202	11/20/84
4,483,243	06/273,088	11/20/84
4,483,245	06/439,856	11/20/84
4,483,246	06/360,792	11/20/84
4,483,248	06/481,749	11/20/84
4,483,251	06/318,478	11/20/84
4,483,256	06/508,289	11/20/84
4,483,257	06/491,366	11/20/84
4,483,258	06/515,570	11/20/84
4,483,260	06/297,077	11/20/84
4,483,261	06/464,410	11/20/84
4,483,263	06/614,580	11/20/84
4,483,264	06/364,545	11/20/84
4,483,266	06/265,081	11/20/84
4,483,268	06/379,350	11/20/84
4,483,269	06/268,357	11/20/84
4,483,274	06/453,791	11/20/84
4,483,275	06/467,316	11/20/84
4,483,278	06/493,210	11/20/84
4,483,283	06/494,532	11/20/84
4,483,287	06/376,688	11/20/84
4,483,288	06/475,484	11/20/84
4,483,289	06/336,374	11/20/84
4,483,290	06/363,270	11/20/84
4,483,291	06/460,710	11/20/84
4,483,294	06/351,900	11/20/84
4,483,296	06/417,969	11/20/84
4,483,298	06/592,738	11/20/84
4,483,301	06/413,900	11/20/84
4,483,302	06/460,437	11/20/84
4,483,303	06/471,249	11/20/84
4,483,304	06/341,145	11/20/84
4,483,308	06/599,300	11/20/84
4,483,309	06/495,737	11/20/84
4,483,310	06/395,374	11/20/84
4,483,311	06/521,291	11/20/84
4,483,312	06/403,484	11/20/84
4,483,313	06/464,697	11/20/84
4,483,314	06/502,607	11/20/84
4,483,315	06/337,703	11/20/84
4,483,317	06/352,935	11/20/84
4,483,318	06/493,549	11/20/84
4,483,320	06/464,717	11/20/84
4,483,321	06/408,461	11/20/84
4,483,322	06/368,582	11/20/84
4,483,324	06/494,702	11/20/84
4,483,325	06/493,067	11/20/84
4,483,327	06/389,030	11/20/84
4,483,330	06/400,914	11/20/84
4,483,332	06/455,361	11/20/84
4,483,334	06/483,622	11/20/84
4,483,337	06/431,335	11/20/84
4,483,339	06/584,765	11/20/84
4,483,343	06/349,453	11/20/84
4,483,344	06/473,262	11/20/84
4,483,346	06/526,260	11/20/84
4,483,347	06/356,326	11/20/84
4,483,353	06/399,227	11/20/84
4,483,354	06/536,199	11/20/84
4,483,356	06/407,266	11/20/84
4,483,357	06/468,325	11/20/84
4,483,360	06/473,988	11/20/84
4,483,363	06/534,247	11/20/84
4,483,364	06/362,354	11/20/84
4,483,365	06/402,457	11/20/84
4,483,366	06/370,476	11/20/84
4,483,370	06/462,389	11/20/84
4,483,372	06/489,390	11/20/84
4,483,373	06/470,275	11/20/84
4,483,374	06/438,171	11/20/84
4,483,375	06/380,106	11/20/84
4,483,376	06/415,420	11/20/84
4,483,378	06/484,318	11/20/84
4,483,382	06/531,980	11/20/84
4,483,386	06/423,010	11/20/84
4,483,387	06/421,451	11/20/84
4,483,392	06/364,391	11/20/84
4,483,393	06/423,003	11/20/84
4,483,397	06/453,050	11/20/84
4,483,398	06/457,833	11/20/84
4,483,400	06/527,969	11/20/84
4,483,402	06/326,239	11/20/84
4,483,403	06/375,038	11/20/84
4,483,405	06/400,695	11/20/84
4,483,406	06/445,319	11/20/84
4,483,410	06/461,950	11/20/84
4,483,411	06/235,202	11/20/84
4,483,412	06/439,087	11/20/84
4,483,413	06/448,762	11/20/84
4,483,414	06/508,069	11/20/84
4,483,415	06/515,559	11/20/84
4,483,420	06/394,164	11/20/84
4,483,421	06/346,294	11/20/84
4,483,424	06/470,117	11/20/84
4,483,426	06/604,402	11/20/84
4,483,427	06/460,275	11/20/84
4,483,428	06/319,050	11/20/84
4,483,434	06/374,773	11/20/84
4,483,438	06/442,523	11/20/84
4,483,439	06/425,100	11/20/84
4,483,440	06/316,129	11/20/84
4,483,442	06/553,231	11/20/84
4,483,443	06/433,990	11/20/84
4,483,445	06/431,219	11/20/84
4,483,446	06/439,860	11/20/84
4,483,447	06/382,203	11/20/84
4,483,450	06/551,070	11/20/84
4,483,451	06/450,798	11/20/84
4,483,452	06/328,138	11/20/84
4,483,453	06/530,236	11/20/84
4,483,455	06/409,874	11/20/84
4,483,456	06/340,050	11/20/84
4,483,461	06/280,282	11/20/84
4,483,462	06/396,066	11/20/84
4,483,463	06/403,609	11/20/84
4,483,465	06/290,343	11/20/84
4,483,466	06/351,362	11/20/84
4,483,469	06/596,080	11/20/84
4,483,479	06/485,714	11/20/84
4,483,482	06/344,941	11/20/84
4,483,488	06/485,493	11/20/84
4,483,489	06/382,585	11/20/84
4,483,491	06/487,973	11/20/84
4,483,495	06/444,090	11/20/84
4,483,500	06/378,447	11/20/84
4,483,501	06/494,432	11/20/84
4,483,503	06/364,095	11/20/84
4,483,504	06/333,258	11/20/84
4,483,509	06/390,324	11/20/84
4,483,512	06/392,104	11/20/84
4,483,514	06/366,633	11/20/84
4,483,515	06/411,710	11/20/84

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4,483,516	06/376,577	11/20/84
4,483,522	06/406,540	11/20/84
4,483,523	06/424,954	11/20/84
4,483,525	06/535,424	11/20/84
4,483,531	06/399,416	11/20/84
4,483,533	06/427,691	11/20/84
4,483,535	06/446,643	11/20/84
4,483,536	06/420,244	11/20/84
4,483,538	06/475,440	11/20/84
4,483,539	06/536,909	11/20/84
4,483,540	06/597,874	11/20/84
4,483,545	06/469,354	11/20/84
4,483,546	06/361,352	11/20/84
4,483,547	06/407,433	11/20/84
4,483,548	06/427,596	11/20/84
4,483,550	06/517,630	11/20/84
4,483,552	06/420,296	11/20/84
4,483,555	06/404,189	11/20/84
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4,786,053	07/015,696	11/22/88
4,786,054	07/038,946	11/22/88
4,786,056	07/114,723	11/22/88
4,786,057	07/099,820	11/22/88
4,786,058	07/064,662	11/22/88
4,786,059	06/942,501	11/22/88
4,786,060	07/097,135	11/22/88
4,786,064	07/073,594	11/22/88
4,786,067	06/941,829	11/22/88
4,786,068	06/879,985	11/22/88
4,786,069	07/012,722	11/22/88
4,786,070	07/148,043	11/22/88
4,786,073	06/947,852	11/22/88
4,786,084	06/799,097	11/22/88
4,786,087	07/126,050	11/22/88
4,786,095	07/159,596	11/22/88
4,786,096	07/090,548	11/22/88
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4,786,104	07/172,567	11/22/88
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4,786,130	06/864,802	11/22/88
4,786,144	07/013,332	11/22/88
4,786,149	07/052,548	11/22/88
4,786,158	06/828,135	11/22/88
4,786,159	06/918,988	11/22/88
4,786,167	06/783,578	11/22/88
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4,786,202	06/700,857	11/22/88
4,786,203	07/097,504	11/22/88
4,786,204	06/832,333	11/22/88
4,786,210	07/096,868	11/22/88
4,786,212	07/035,454	11/22/88
4,786,214	07/025,077	11/22/88
4,786,217	07/045,057	11/22/88
4,786,220	07/053,643	11/22/88
4,786,221	06/899,884	11/22/88
4,786,222	07/048,255	11/22/88
4,786,223	07/107,671	11/22/88
4,786,224	07/161,309	11/22/88
4,786,229	06/857,723	11/22/88
4,786,234	06/390,193	11/22/88
4,786,238	07/014,947	11/22/88
4,786,244	07/114,417	11/22/88
4,786,249	07/084,992	11/22/88
4,786,266	06/886,220	11/22/88
4,786,273	07/082,864	11/22/88
4,786,275	07/044,545	11/22/88
4,786,278	06/940,046	11/22/88
4,786,279	06/891,099	11/22/88
4,786,280	07/048,693	11/22/88
4,786,283	07/083,739	11/22/88
4,786,284	06/835,782	11/22/88
4,786,286	06/868,202	11/22/88
4,786,290	07/107,054	11/22/88
4,786,296	07/065,871	11/22/88
4,786,301	07/085,321	11/22/88
4,786,303	07/037,413	11/22/88
4,786,312	07/042,265	11/22/88
4,786,313	07/111,670	11/22/88
4,786,330	07/003,790	11/22/88
4,786,335	06/700,923	11/22/88
4,786,342	06/929,386	11/22/88
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4,786,386	06/755,606	11/22/88
4,786,387	06/911,503	11/22/88
4,786,393	07/054,541	11/22/88
4,786,398	07/037,362	11/22/88
4,786,399	07/102,056	11/22/88
4,786,407	07/153,268	11/22/88
4,786,410	07/011,996	11/22/88
4,786,411	06/770,901	11/22/88
4,786,412	07/124,263	11/22/88
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4,786,422	06/916,068	11/22/88
4,786,424	06/804,714	11/22/88
4,786,449	06/852,226	11/22/88
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4,786,471	06/544,177	11/22/88
4,786,472	06/899,186	11/22/88
4,786,480	06/899,633	11/22/88
4,786,482	07/064,814	11/22/88
4,786,488	06/710,673	11/22/88
4,786,502	06/916,062	11/22/88
4,786,508	06/869,504	11/22/88
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4,786,515	06/942,050	11/22/88
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4,786,543	07/104,962	11/22/88
4,786,547	07/036,501	11/22/88
4,786,548	07/095,062	11/22/88
4,786,594	06/863,268	11/22/88
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4,786,604	07/065,356	11/22/88
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4,786,649	06/929,847	11/22/88
4,786,650	06/825,304	11/22/88
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4,786,654	07/053,911	11/22/88
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4,786,683	07/054,465	11/22/88
4,786,684	06/899,209	11/22/88
4,786,710	07/054,336	11/22/88
4,786,711	07/006,409	11/22/88
4,786,717	06/928,766	11/22/88
4,786,725	06/835,584	11/22/88
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4,786,732	07/081,515	11/22/88
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4,786,741	06/441,191	11/22/88
4,786,744	06/745,579	11/22/88
4,786,747	07/048,505	11/22/88
4,786,755	06/845,704	11/22/88
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4,786,763	07/175,025	11/22/88
4,786,768	07/087,715	11/22/88
4,786,779	06/945,980	11/22/88
4,786,787	07/141,734	11/22/88
4,786,806	07/064,491	11/22/88
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4,786,833	07/039,102	11/22/88
4,786,837	07/046,076	11/22/88
4,786,852	07/169,141	11/22/88
4,786,871	07/065,358	11/22/88
4,786,872	07/065,359	11/22/88
4,786,873	06/871,730	11/22/88
4,786,887	07/080,183	11/22/88
4,786,905	06/844,046	11/22/88
4,786,909	06/822,214	11/22/88
4,786,916	06/936,795	11/22/88
4,786,925	07/067,930	11/22/88
4,786,958	06/931,345	11/22/88
4,786,964	07/009,934	11/22/88
4,786,975	07/147,665	11/22/88
4,786,983	06/379,577	11/22/88
4,786,994	06/803,508	11/22/88
4,786,995	06/927,916	11/22/88
4,787,008	07/023,210	11/22/88
4,787,014	07/078,710	11/22/88
4,787,019	07/024,132	11/22/88
4,787,023	07/059,589	11/22/88
4,787,024	06/890,207	11/22/88
4,787,034	07/091,361	11/22/88
4,787,092	07/161,412	11/22/88

Erratum

In the list of patents which expired on Oct. 25, 1991, due to failure to pay maintenance fees, in O.G. of Jan. 7, 1992, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,411,963	06/280,8474	10/25/83	7/06/81

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,454,662	06/347,419	6/19/84	2/10/82	12/11/92
4,466,325	06/372,051	8/21/84	4/26/82	12/09/92
4,475,556	06/454,984	10/09/84	1/03/83	12/18/92
4,578,648	06/600,723	3/25/86	4/16/84	12/15/92
4,605,501	06/754,240	8/12/86	7/12/85	12/23/92
4,712,096	06/732,875	12/08/87	5/10/85	12/24/92

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,672,550, Re. S.N. 07/980,437, Filed Nov. 23, 1992, Cl. 364, COMPUTER CONTROLLED MACHINE TOOL, Robert J. H. Winterbottom, et. al., Owner of Record: *AE PLC, Cawston Rugby Warwickshire, England*, Attorney or Agent: Michael J. Keenan, Ex. Gp.: 2306

4,959,615, Re. S.N. 07/950,316, Filed Sept. 24, 1992, Cl. 324/690, ELECTRODE STRUCTURE FOR CAPACITANCE-TYPE MEASUREMENT TRANSDUCERS, Nils I. Andermo, Owner of Record: *Micro Encoder, Inc., Kirkland, Wa.*, Attorney or Agent: Edward P. Walker, Ex. Gp.: 2607

4,961,204, Re. S.N. 07/956,032, Filed Oct. 2, 1992, Cl. 375/25, PCM SIGNAL GENERATING/REPRODUCING APPARATUS, Hiromichi Tanaka, et. al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Carl I. Brundidge, Ex. Gp.: 2614

4,976,854, Re. S.N. 07/989,094, Filed Dec. 11, 1992, Cl. 210/168, OIL FILTER II, Hisashi Yanu, et. al., Owner of Record: *Mitsubishi Oil Co., Ltd., Tokyo, Japan*, Attorney or Agent: Richard D. Conard, Ex. Gp.: 1306

5,027,801, Re. S.N. 07/987,622, Filed Dec. 9, 1992, Cl. 128/80, ORTHOPAEDIC GEL PAD ASSEMBLY, Tracy E. Grim, Owner of Record: *Royce Medical Co., Westlake Village, Calif.*, Attorney or Agent: Alan C. Rose, Ex. Gp.: 3302

5,033,904, Re. S.N. 07/990,278, Filed Dec. 4, 1992, Cl. 403/292, TUBULAR DOWEL SYSTEM, Brian Challis, Owner of Record: *Challis Stairways, Inc., Sandy, Ut.*, Attorney or Agent: Calvin E. Thorpe, Ex. Gp.: 3501

5,103,337, Re. S.N. 07/989,303, Filed Dec. 11, 1993, Cl. 359/359, INFRARED REFLECTIVE OPTICAL INTERFERENCE FILM, Walter J. Schrenk, et. al., Owner of Record: *The Dow Chemical Co., Midland, Mich.*, Attorney or Agent: Lloyd E. Hessenaur, Jr., Ex. Gp.: 2507

5,107,922, Re. S.N. 07/988,405, Filed Nov. 30, 1992, Cl. 165/109, OPTIMIZED OFFSET STRIP FOR USE IN COMPACT HEAT EXCHANGERS, Allan K. So., Owner of Record: *Long Manufacturing Ltd., Ontario, Canada*, Attorney or Agent: Judith M. Riley, Ex. Gp.: 3407

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,617,479, Reexam. No. 90/002,916, Requested Dec. 31, 1992, Cl. 307/465, PROGRAMMABLE LOGIC ARRAY DEVICE USING EPROM TECHNOLOGY, Robert F. Hartmann, et. al., Owner of Record: *Altera Corp., San Jose, Calif.*, Attorney or Agent: Vern Norviel, Townsend and Townsend, San Francisco, Calif., Ex. Gp.: 2509, Requester: Owner

5,007,128, Reexam. No. 90/002,887, Requested Nov. 10, 1992, Cl. 015/230.16, COMPOUNDING, GLAZING OR POLISHING PAD, Richard L. Englund, et. al., Owner of Record: *Minnesota Mining and Manufacturing Co., Inc., St. Paul, Minn.*, Attorney or Agent: William L. Huebsch, St. Paul, Minn., Ex. Gp.: 2402, Requester: Owner

5,030,259, Reexam. No. 90/002,915, Requested Dec. 16, 1992, Cl. 055/302, PORTABLE VACUUM CLEANING SYSTEM, Earl R. Bryant, et. al., Owner of Record: *Guzzler Manufacturing, Inc., Birmingham, Al.*, Attorney or Agent: George M. Thomas, Atlanta, Ga., Ex. Gp.: 1305, Requester: Owner

Notice of Expiration of Trademark Registrations Due to Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED JAN. 4, 1993 DUE TO FAILURE TO RENEW

Reg. No.	Serial Number	Reg. Date
86,000	71/060,021	04/02/1912
86,009	71/054,000	04/02/1912
292,740	71/321,852	03/29/1932
292,743	71/321,855	03/29/1932
292,771	71/321,848	03/29/1932
292,823	71/320,555	03/29/1932
292,831	71/319,569	03/29/1932
292,835	71/320,240	03/29/1932
292,839	71/321,837	03/29/1932
292,849	71/316,292	03/29/1932

Reg. No.	Serial Number	Reg. Date
292,857	71/315,704	03/29/1932
292,859	71/315,597	03/29/1932
292,875	71/321,403	03/29/1932
292,876	71/321,419	03/29/1932
292,892	71/320,645	03/29/1932
292,903	71/321,443	03/29/9132
292,919	71/317,052	03/29/1932
556,820	71/536,884	04/01/1952
556,827	71/546,874	04/01/1952
556,829	71/550,023	04/01/1952
556,831	71/552,277	04/01/1952
556,833	71/553,344	04/01/1952
556,835	71/557,046	04/01/1952
556,837	71/558,432	04/01/1952
556,839	71/561,020	04/01/1952
556,841	71/562,812	04/01/1952
556,848	71/575,828	04/01/1952
556,850	71/576,646	04/01/1952
556,861	71/581,803	04/01/1952
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556,900	71/598,718	01/04/1952
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556,906	71/601,095	04/01/1952
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556,925	71/606,232	04/01/1952
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556,939	71/609,690	04/01/1952
556,945	71/610,002	04/01/1952
556,954	71/610,964	04/01/1952
556,957	71/611,130	04/01/1952
556,958	71/611,158	04/01/1952
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556,962	71/611,782	04/01/1952
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557,049	71/603,928	04/01/1952
557,052	71/605,870	04/01/1952
557,054	71/607,691	04/01/1952
557,057	71/609,031	04/01/1952
557,062	71/614,170	04/01/1952
557,063	71/614,287	04/01/1952
557,072	71/598,501	04/01/1952
557,085	71/579,318	04/01/1952
557,086	71/579,446	04/01/1952
557,087	71/581,896	04/01/1952
931,191	72/186,068	03/28/1972
931,192	72/207,709	03/28/1972
931,198	72/378,793	03/28/1972
931,200	72/360,192	03/28/1972
931,204	72/344,252	03/28/1972
931,205	72/346,383	03/28/1972
931,207	72/366,977	03/28/1972
931,215	72/375,508	03/28/1972
931,220	72/397,289	03/28/1972
931,221	72/397,636	03/28/1972
931,231	72/395,175	03/28/1972
931,239	72/386,960	03/28/1972
931,244	72/294,669	03/28/1972
931,246	72/367,191	03/28/1972
931,248	72/371,288	03/28/1972
931,251	72/388,247	03/28/1972
931,257	72/356,442	03/28/1972
931,261	72/367,941	03/28/1972
931,263	72/375,113	03/28/1972
931,276	72/318,569	03/28/1972
931,279	72/353,489	03/28/1972
931,281	72/357,380	03/28/1972
931,287	72/380,576	03/28/1972
931,292	72/383,958	03/28/1972
931,294	72/386,782	03/28/1972
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931,299	72/387,128	03/28/1972
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931,311	72/354,913	03/28/1972
931,315	72/359,021	03/28/1972
931,323	72/366,355	03/28/1972
931,324	72/366,356	03/28/1972
931,325	72/367,836	03/28/1972
931,330	72/373,539	03/28/1972
931,331	72/373,699	03/28/1972
931,336	72/375,806	03/28/1972
931,341	72/376,617	03/28/1972
931,342	72/376,681	03/28/1972
931,344	72/380,708	03/28/1972
931,345	72/381,461	03/28/1972
931,347	72/388,281	03/28/1972
931,350	72/398,665	03/28/1972
931,356	72/340,157	03/28/1972
931,357	72/340,158	03/28/1972
931,359	72/346,809	03/28/1972
931,360	72/355,242	03/28/1972
931,368	72/375,510	03/28/1972
931,375	72/379,917	03/28/1972
931,376	72/380,625	03/28/1972
931,381	72/366,955	03/28/1972
931,384	72/355,917	03/28/1972
931,390	72/364,557	03/28/1972
931,393	72/345,091	03/28/1972
931,398	72/314,122	03/28/1972
931,399	72/314,377	03/28/1972
931,400	72/323,022	03/28/1972
931,405	72/376,606	03/28/1972
931,407	72/378,246	03/28/1972
931,411	72/383,643	03/28/1972
931,413	72/383,951	03/28/1972
931,415	72/359,777	03/28/1972
931,430	72/366,936	03/28/1972
931,433	72/369,512	03/28/1972
931,435	72/372,452	03/28/1972
931,437	72/373,843	03/28/1972
931,438	72/374,082	03/28/1972
931,442	72/375,188	03/28/1972
931,448	72/381,285	03/28/1972
931,450	72/382,257	03/28/1972
931,454	72/387,849	03/28/1972
931,460	72/395,675	03/28/1972
931,461	72/398,528	03/28/1972
931,463	72/365,471	03/28/1972
931,467	72/394,967	03/28/1972
931,468	72/327,432	03/28/1972
931,472	72/381,823	03/28/1972
931,473	72/381,824	03/28/1972
931,476	72/339,308	03/28/1972
931,485	72/398,002	03/28/1972
931,488	72/339,676	03/28/1972
931,489	72/346,965	03/28/1972
931,494	72/356,730	03/28/1972
931,496	72/363,266	03/28/1972
931,497	72/364,777	03/28/1972
931,498	72/364,778	03/28/1972
931,500	72/377,128	03/28/1972

Reg. No.	Serial Number	Reg. Date
931,501	72/377,755	03/28/1972
931,503	72/386,102	03/28/1972
931,508	72/333,207	03/28/1972
931,512	72/338,519	03/28/1972
931,515	72/345,815	03/28/1972
931,516	72/347,637	03/28/1972
931,521	72/361,280	03/28/1972
931,524	72/370,891	03/28/1972
931,529	72/388,493	03/28/1972
931,530	72/388,829	03/28/1972
931,532	72/312,276	03/28/1972
931,533	72/341,470	03/28/1972
931,534	72/356,175	03/28/1972
931,538	72/387,692	03/28/1972
931,541	72/318,977	03/28/1972
931,544	72/345,012	03/28/1972
931,545	72/361,148	03/28/1972
931,547	72/365,581	03/28/1972
931,548	72/385,916	03/28/1972
931,552	72/358,283	03/28/1972
931,553	72/358,284	03/28/1972
931,557	72/372,212	03/28/1972
931,558	72/386,531	03/28/1972
931,560	72/364,771	03/28/1972
931,561	72/351,886	03/28/1972
931,564	72/367,092	03/28/1972

Errata

"All reference to 5,173,480 to Vivien Wong, et. al., Ardsley, N.Y., for METHODS OF TREATING DEGENERATIVE DISEASES OR DISORDERS OF THE CENTRAL NERVOUS SYSTEM appearing in the *Official Gazette* of Dec. 22, 1992 should be deleted since no patent was granted."

"All reference to Patent No. 5,178,741 to Youhei Kuwabara of Japan, for ELECTROLYTIC FINISHING METHOD appearing in the *Official Gazette* of Jan. 12, 1993 should be deleted since no patent was granted."

"All reference to Patent No. 5,179,226 to Kaoru Inoue, et. al. of Japan for RE-KEYABLE PIN TUMBLER DRAWER LOCK AND PIN TUMBLER CABINET DOOR LOCK, appearing in the *Official Gazette* of Jan. 12, 1993 should be deleted since no patent was granted."

Request for Suggestions for Additions to the "Acceptable Identification of Goods and Services Manual"

The purpose of this notice is to solicit suggestions from trademark practitioners and trademark owners to add listings to the "Acceptable Identification of Goods and Services Manual" used by examining attorneys.

The manual, which was last revised in 1991, serves as a guide in the examination of identifications of goods and services in trademark applications. The manual lists numerous descriptions of goods and services which should be accepted in an application. The list is not exhaustive of all description which are acceptable and is subject to change without notice. The manual provides useful documentation to expedite approval of applications and to minimize inconsistency in office actions. Earlier versions of the manual have been included as an appendix to Jerome Gilson's *Trademark Protection and Practice*. The manual is also available for purchase from the U.S. Trademark Association.

The Office intends to issue another revision to the manual in 1993. To produce the best manual possible, we are soliciting input from interested parties to produce a manual which is more useful not only to PTO personnel, but also to trademark applicants and practitioners. Although we welcome any comments or suggestions related to general policies governing acceptable identifications of goods and services, we are most interested in suggestions for new listings of specific, acceptable identifications for inclusion in the revision.

Many practitioners have suggested that Examining Attorneys are overly restrictive in handling broadly worded identifications. Presently, it is Office policy to require brief identifications which use the common names of the goods or services or succinctly worded descriptions when no common names exist. Furthermore, when the mark is used on a number of items which make up a homogenous group, it is acceptable to use a term which identifies the group as a whole and which would be understood as encompassing products or services of the same general type which are commercially related. TMEP § 804.02 (January 1986).

In the spirit of allowing the maximum flexibility under current identification policy, and in response to the recent comments of practitioners, the Office encourages those concerned to submit specific examples of broadly worded identifications which they consider acceptable. Any suggestions, however, must satisfy three basic criteria: (1) the identification must be sufficiently specific to permit classification of the goods or services and must not include any term which includes particular items which are classified in more than one International Class; (2) the identification must be sufficiently specific to determine likelihood of confusion; and (3) the identification must be sufficiently specific to provide notice to third parties as to the scope of the applicant's rights in the mark.

Although the Office will accept comments or suggestions at any time, the office requests that suggestions for additions to the manual should be submitted by April 1, 1993. All suggestions and comments should be sent to the attention of Alan Datri, Administrator for Trademark Classification and Practice, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Jan. 7, 1993

JEFFREY M. SAMUELS
Assistant Commissioner for Trademarks

Patent and Trademark Office
37 CFR Part 1
[Docket No. 921118-2318]
RIN : 0651-AA63

Patent Interference Practice Burden of Proof

Agency: Patent and Trademark Office, Commerce
Action: Notice of Proposed Rulemaking
Summary: The Patent and Trademark Office (PTO) proposes to amend its rules of practice in patent interference cases. As a result of issues arising in some recent cases, it is apparent that parties in interference cases would be helped if the interference rules explicitly stated which party has the burden of proof when a motion is filed. There is also some confusion with respect to the nature of the evidence that should be submitted with a preliminary motion, particularly when testimony is needed to support or oppose the preliminary motion. PTO proposes to specify that a party filing a motion has the burden of proof. PTO also proposes to more clearly specify the nature of expert witness and factual witness evidence that must accompany a preliminary motion. Finally, PTO proposes to add a definition of an interlocutory order, as contrasted with a final decision, in order to clarify the meaning of an interlocutory order.
Dates: Comments must be submitted on or before Mar. 8, 1993. A public hearing will not be held.
Addresses: Address written comments to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231, marked to the attention of Fred E. McKelvey, Solicitor. Written comments will be available for public inspection in Suite 918, on the 9th floor of Crystal Park II, located at 2121 Crystal Drive, Arlington, Virginia.
For Further Information Contact: Fred E. McKelvey by telephone at (703) 305-9035 or by mail marked to his attention and addressed to Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The PTO conducts interference proceedings to determine who, as between two or more appli-

cants for patent or one or more applicants and one or more patentees, is the first inventor of a patentable invention. In the course of interference proceedings, the Board of Patent Appeals and Interferences enters two kinds of decisions, interlocutory orders and final decisions. There has been some confusion as to what orders are interlocutory orders. The PTO is proposing to add subsection (q) to 37 CFR § 1.601 to define an interlocutory order and to contrast interlocutory orders with the final decision. The presumption of correctness of an interlocutory order, which is presently in 37 CFR § 1.655(a), is proposed to be moved to proposed new subsection 1.601(q), and to be deleted from § 1.655(a). The definition of intrelocutory order would include the decision represented by the notice declaring the interference.

Under the interfernece rules, a party in an interference is authorized to file motions, including preliminary motions (37 CFR § 1.633), motions to correct inventorship (37 CFR § 1.634) and miscellaneous motions (37 CFR § 1.635). When necessary, a preliminary motion should be accompanied by evidence (37 CFR § 1.639). Recently there has been confusion as to who has the burden of proof when a motion is filed. For example, when transmitting papers to the Board for declaration of an interference, the Primary Examiner determines in the first instance the extent, if any, to which a party is entitled to the filing date of an earlier domestic or foreign application. 37 CFR § 1.609(b)(4). The interference is then declared by an examiner-in-chief and an indication is given that a party has been accorded the benefit of the filing date of an earlier application. 37 CFR § 1.611(c)(5). An opponent, however, is authorized to challenge the initial decision of the Primary Examiner and the examiner-in-chief to accord benefit. The challenge is made through a preliminary motion. 37 CFR § 1.633(g). It is the PTO's position that the party filing the motion bears the burden of proof to show that its opponent should not have been accorded the benefit of the filing date of an earlier application. If adopted, the proposed rules would make explicit in 37 CFR § 1.637(a) that a party filing a motion has the burden of proving why it is entitled to the relief sought in the motion.

Another difficulty in interference cases has been compliance with 37 CFR § 1.639 with respect to evidence that must accompany a preliminary motion. In 1990, a decision was entered in *Hanagan v. Kimura*, 16 USPQ2d 1791, 1794 (Comm'r Pat. 1990), that provided the following guidance:

> To the extent it may prove useful, the following guidance is provided. When expert testimony is needed in support of, or in opposition to, a preliminary motion, a party should:
>
> (1) identify the person whom it expects to call as an expert;
> (2) state the field in which the person is alleged to be an expert; and
> (3) state in a declaration signed by the person
> (a) the subject matter on which the person is expected to testify,
> (b) the facts and opinions to which the person is expected to testify, and
> (c) a summary of the grounds and basis for each opinion.
>
> If a person is to be called as a fact witness, a declaration by that person stating the facts should be filed.
>
> If the other party is to be called, or if evidence in the possession of the other party is necessary, an explanation of the evidence sought, what it will show, and why it is needed must be supplied.
>
> When inter partes tests are to be preformed, a description of the tests stating what they will show must be presented.
>
> The nature of the showing under § 1.639(c) will vary from case to case.

Nothing in the rule change being proposed would alter the need to supply evidence in support of, or in opposition to, a preliminary motion. The rules being proposed would codify the *Hanagan* guidelines. Subsection (c) of § 1.639 is proposed to be amended to refer to "additional evidence in the form of testimony" so as to distinguish the evidence needed under subsection (c) from that which may be submitted under subsection (a) and (b).

Proposed subsection (d) to 37 CFR § 1.639 would specify the nature of evidence that must be submitted when an opinion of an expert is needed. The statement which would be required under proposed subsection (d) would be essentially the same as discovery required under Rule 26(b)(4)(A)(i) of the Federal Rules of Civil Procedure.

Proposed subsection (e) would specify the nature of evidence that must be submitted when a statement of a fact witness is to relied upon.

Proposed subsection (f) would specify the nature of a showing which should be made when a statement of an opponent is needed or evidence in possession of an opponent is needed.

Proposed subsection (g) would specify the nature of evidence that must be supplied if inter partes tests are to be conducted.

The party filing the preliminary motion would be expected to supply all necessary evidence with the preliminary motion. Likewise, a party opposing a preliminary motion should supply with the opposition all needed evidence in support of the opposition. Normally, if a party cannot obtain all necessary evidence to support or oppose a preliminary motion, and can show good cause, the party should seek an extension of time to file or oppose the preliminary motion. In an unuasual situation, the guidance may not apply in the case of a party opposing a preliminary motion. In a recent interference, an examiner-in-chief deferred to final hearing consideration of a preliminary motion which had been accompanied by considerable evidence. The opponent had requested leave to take testimony. Based on the amount of evidence submitted with the preliminary motion, it was the examiner-in-chief's view that it would have been manifestly unfair to require the opponent to have prepared a full case in opposition to the preliminary motion in the 20-day period set for filing oppositions. As noted by the examiner-in-chief in the instance mentioned above, more leeway as to the evidence, and when it is supplied, can properly be granted to a party opposing a preliminary motion than a party filing a preliminary motion. The party filing the preliminary motion knows what must be proved. A party opposing the preliminary motion may or may not have time to fully respond with evidence accompanying an opposition. If an examiner-in-chief finds in a particular case that a party, during the time allowed for filing an opposition to a preliminary motion, could not reasonably have fully marshalled its evidence for presentation along with the opposition to a preliminary motion, a testimony period may be set. Alternatively, the examiner-in-chief, *sua sponte* or on motion of the opponent, may grant an extension of time to gather and supply the evidence. The action to be taken is a matter within the discretion of the examiner-in-chief.

Present 37 CFR 1.655(a) is proposed to be amended by deleting the last sentence, which would be moved to and be included in the proposed definition of interlocutory order in proposed subsection 1.601(q). The burden of showing error in entry of an interlocutory order is on the party challenging the order. If the order involved a procedural matter, the challenger must show that an examiner-in-chief or a panel abused discretion in entering the order. If the order involved a non-procedural matter (i.e., granting a motion for judgement based on unpatentability), the challenger must show legal error.

In some instances, two or more interlocutory orders may involve the same issue. For example, a notice declaring an interference may accord a party benefit of an earlier application. A preliminary motion may result in the party being denied benefit. When there are two or more interlocutory orders involving the same issue, the latest interlocutory order is presumed to be correct in further proceedings in the interference.

OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Orders 12291 and 12612 and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that these proposed rule changes will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibilty Act, 5 U.S.C. 605(b)). The principal impact of these proposed changes would be to clarify procedure in patent interference and thereby eliminate any ambiguity which might exist in current rules.

The Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect

on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers; individuals; industries; Federal, state or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovation or on the ability of United States-based enterprises to compete with foriegn-based enterprises in domestic or export markets.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, since no recordkeeping or reporting requirements within the coverage of the Act are placed upon the public.

LIST OF SUBJECTS
37 CFR Part 1

Administrative practice and procedure, Courts, Inventions and patents.

PART 1 - RULES OF PRACTICE IN PATENT CASES

For the reasons set out in the preamble, it is proposed to amend 37 CFR part 1 wherein removals are indicated by brackets ([ ]) and additions by arrows (◀▶):

1. The authority citation for 37 CFR part 1 would continue to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.601 is proposed to be amended by adding paragraph (q) to read as follows:

§ 1.601 Scope of rules, definitions.

* * * * *

▶(q) A *final decision* is a decision awarding judgment as to all counts. An *interlocutory order* is any other action taken by an examiner-in-chief or a panel of the Board in an interference, including the notice declaring an interference. All interlocutory orders shall be presumed to have been correct and the burden of showing error or an abuse of discretion shall be on the party attacking the order. When two or more interlocutory orders involve the same issue, the last entered order shall be presumed to have been correct.◀

3. Section 1.637 is proposed to be amended by revising paragraph (a) to read as follows:

§ 1.637 Content of motions.

(a) ▶A party filing a motion has the burden of proof to show that it is entitled to the relief sought in the motion.◀ Every motion shall include (1) a statement of the precise relief requested, (2) a statement of the material facts in support of the motion, and (3) a full statement of the reasons why the relief requested should be granted.

* * * * *

4. Section 1.639 is proposed to be amended by revising paragraph (c) and by adding subsections (d) through (g) as follows:

§ 1.639 Evidence in supporet of motion, opposition, or reply.

* * * * *

(c) When a party believes that ▶additional evidence in the form of◀ testimony is necessary to support or oppose a preliminary motion under § 1.633 or a motion to correct inventorship under § 1.634, the party shall describe the nature of any proposed testimony ▶in the manner specified in paragraph (d) through (g) of this section◀. If the examiner-in-chief finds that testimony is needed to decide the motion, the examiner-in-chief may grant appropriate interlocutory relief and enter an order authorizing the taking of testimony and deferring a decision on the motion to final hearing.

▶(d) When the testimony is needed in support of or opposition to a preliminary motion is expert testimony, the moving party or opponent should:

(1) identify the person whom it expects to call as an expert;

(2) state the field in which the person is alleged to be an expert; and

(3) state:

(i) the subject matter on which the person is expected to testify;

(ii) the facts and opinions to which the person is expected to testify; and

(iii) a summary of the grounds and basis for each opinion.

(e) If a fact witness is to be relied upon, state the facts to which the witness will testify.

(f) If the opponent is to be called, or if evidence in the possession of the opponent is necessary, explain the evidence sought, what it will show, and why it is needed.

(g) When inter partes tests are to be performed, describe the tests stating what they will be expected to show.◀

5. Section 1.655 is proposed to be amended by removing the last sentence of paragraph (a) as follows:

§ 1.655 Matters considered in rendering a final decision.

(a) In rendering a final decision, the Board may consider any properly raised issue including (1) priority of invention, (2) derivation by an opponent from a party who filed a preliminary statement under § 1.625, (3) patentability of the invention, (4) admissibility of evidence, (5) any interlocutory matter deferred to final hearing, and (6) any other matter necessary to resolve the interference. The Board may also consider whether any interlocutory order was erroneous or an abuse of discretion. [All interlocutory orders shall be presumed to have been correct and the burden of showing manifest error or an abuse of discretion shall be on the party attacking the order.]

* * * * *

Dec. 30, 1992 EDWARD E. KUBASIEWICZ
Assistant Commissioner for Patents

PATENT NOTICES

Certificates of Correction For Week of February 2, 1993

D. 313,301	4,994,462	5,028,372	5,045,759
D. 320,105	4,996,177	5,028,432	5,045,937
4,513,251	4,996,224	5,028,504	5,046,025
4,632,888	4,999,641	5,028,732	5,046,508
4,811,216	5,000,837	5,029,077	5,046,734
4,824,645	5,002,123	5,029,468	5,047,199
4,831,274	5,003,050	5,029,959	5,047,500
4,837,549	5,003,070	5,029,991	5,047,530
4,854,836	5,003,626	5,030,451	5,048,533
4,856,642	5,004,505	5,030,929	5,048,615
4,858,534	5,005,423	5,031,865	5,049,123
4,864,019	5,005,620	5,031,961	5,050,176
4,872,088	5,006,111	5,032,000	5,050,511
4,884,445	5,006,471	5,032,191	5,050,891
4,888,139	5,006,890	5,032,568	5,051,197
4,903,619	5,007,003	5,033,020	5,051,512
4,904,330	5,009,785	5,034,156	5,051,933
4,910,131	5,011,451	5,035,240	5,051,981
4,913,898	5,012,117	5,035,301	5,052,365
4,918,108	5,013,526	5,035,484	5,053,156
4,921,133	5,014,438	5,036,026	5,053,226
4,933,711	5,016,914	5,036,474	5,054,350
4,939,278	5,017,084	5,036,628	5,054,928
4,943,228	5,017,721	5,036,900	5,055,313
4,944,232	5,017,755	5,037,828	5,056,471
4,945,920	5,018,884	5,038,311	5,057,295
4,950,809	5,019,311	5,038,752	5,058,689
4,955,799	5,019,353	5,039,064	5,058,875
4,959,743	5,020,856	5,039,379	5,058,991
4,968,135	5,021,551	5,039,644	5,059,471
4,969,040	5,021,649	5,039,693	5,059,531
4,972,764	5,022,072	5,041,123	5,059,893
4,979,339	5,022,991	5,041,502	5,060,177
4,981,706	5,023,693	5,042,518	5,060,629
4,983,179	5,025,017	5,042,731	5,060,763
4,985,202	5,025,262	5,043,774	5,061,787
4,987,569	5,026,723	5,044,028	5,083,402
4,988,514	5,026,748	5,044,553	
4,992,274	5,027,360	5,045,167	
4,994,323	5,028,137	5,045,259	

SPECIAL BOXES FOR MAIL

Special PTO mail box numbers should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded directly to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these boxes. If any documents other than the specified type identified for each box are addressed to that box, they will be delayed in reaching the appropriate area for which they are intended.

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Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions to revive, petitions to accept late payment of fees, petitions to defer issue, and petitions to withdraw an application from issue.
Box Assignment	All assignment documents except those filed with new applications.
Box DD	Mail related to Disclosure Documents.
Box EEO	Mail for the Office of Equal Employment Programs.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62)
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All Communications following the receipt of a PTOL-85. "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box ITU	All intent to use documents, excluding the initial application and amendments to allege use.
Box M. Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box OED	Mail for the Office of Enrollment and Discipline
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box TRADEMARK	New trademark application and associated papers and APPLICATION fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.

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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PDTLs have both the patent and trademark sections of the *Official Gazette of the U. S. Patent and Trademark Office.* The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that prelminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage: Z. J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles City Library	(213) 612-3273
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-8847
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa: Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette: Siegesmund Engineering Library, Purdue University	(317) 494-2873
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 561-8617
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	Not Yet Operational
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 932-2895
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New York	Albany: New York State Library	(518) 473-4636
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280

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Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
	Clemson University Libraries	Not Yet Operational
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library,Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-4510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

EDWARD E. KUBASIEWICZ, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 1100 — D. E. TALBERT, Director	308-0661	2/06/92
ORGANIC CHEMISTRY, GROUP 1200 — JOHN F. TERAPANE, JR., Director	308-1235	4/30/92
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300 — DONALD CZAJA, Acting Director	308-0651	4/10/92
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 1500 — J. O. THOMAS, Director	308-2351	4/10/92
BIOTECHNOLOGY, GROUP 1800 — BARRY S. RICHMAN, Acting Director	308-0196	6/27/91
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100 — D. G. KELLY, Director	308-1782	7/09/91
SPECIAL LAWS ADMINISTRATION, GROUP 2200 — ROBERT E. GARRETT, Director	308-0511	6/22/91
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 2300 — GERALD GOLDBERG, Director	308-0754	9/26/90
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 2400 — CARLTON CROYLE, Director	308-0771	1/10/92
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500 — JOSEPH J. ROLLA, Director	308-0956	8/20/91
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600 — BOBBY R. GRAY, Director	305-4700	6/15/91
DESIGN, GROUP 2900 — ROBERT E. GARRETT, Director	308-0511	9/09/90
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100 — F. R. SCHMIDT, Director	308-1113	12/07/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200 — N. GODICI, Director	308-1148	3/31/92
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 3300 — J. J. LOVE, Director	308-0858	3/24/92
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400 — JOHN KITTLE, Director	308-0861	4/03/92
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500 — A.L. SMITH, Director	308-1021	1/07/92

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during January 1993 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

Patents ..... Numbers 3,930,271 to 3,935,595 inclusive
Plant Patents ..... 3,824 to 3,827

STATUTORY INVENTION REGISTRATIONS

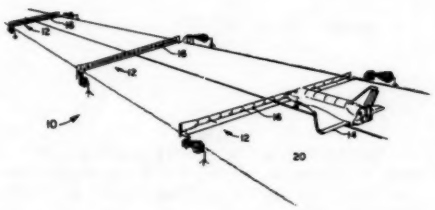
PUBLISHED FEBRUARY 2, 1993

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1133
AIRCRAFT ARRESTING SYSTEM AND METHOD

William P. Bridges, Andrews AFB, Md.; James Y. Adkins, Niceville, Fla., and Steven W. Leas, Lancaster, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 15, 1990, Ser. No. 540,718
Int. Cl.[5] B64C *25/68*; B64F *1/02*
U.S. Cl. 244—110 C **11 Claims**



11. A method of arresting an aircraft having ground engaging landing gear including a forward nose gear and a main landing gear upon a runway having an elongated longitudinal axis comprising the steps of:

(a) positioning a triggering net having a height less than the height of the aircraft, a landing gear engaging cable and fluid braking means attached thereto transversely to the longitudinal axis of the runway;

(b) engaging the main landing gear with said cable in response to contact of said net by the aircraft nose gear;

(c) deploying said fluid braking means by said cable to arrest the aircraft;

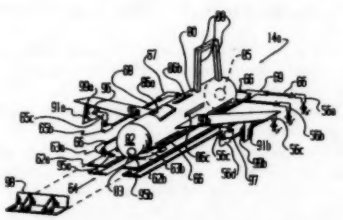
(d) determining the rate of arrest of the aircraft; and,

(e) repeating steps (a) through (c) to effect a greater rate of arrest from said determining step, when desired.

H1134
AIRCRAFT FIRE-FIGHTING TRAINING APPARATUS

Donald H. Meadows, Kintnersville, and Vincent J. Crusco, Hatboro, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 11, 1991, Ser. No. 760,778
Int. Cl.[5] G09B *9/00*
U.S. Cl. 434—226 **13 Claims**



1. A fire-fighting training apparatus, comprising:

a. a vehicle mock-up having a front and a back end with a plurality of vents therein;

b. fuel storage means spaced apart from said mock-up;

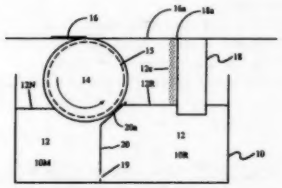
c. fire production means located at said vehicle mockup; and

d. fuel supply means leading from said fuel storage means to said fire production means.

H1135
TONER APPLICATION AND CIRCULATION APPARATUS

Vernon R. Schwartz, S. 4120 Linke Rd., Greenacres, Wash. 99016

Filed May 3, 1990, Ser. No. 518,694
Int. Cl.[5] B05C *11/00*
U.S. Cl. 118—689 **8 Claims**



1. A toner supply circulation apparatus for an electrostatic imaging system in which a latent image is developed on a medium comprising:

means for supplying toner concentrate;

means for supplying a carrier;

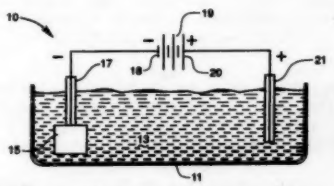
a mixer manifold for receiving and mixing said toner concentrate and said carrier to produce a toner solution; and

vacuum means coupled to said mixer manifold for establishing a vacuum in said manifold and transferring said toner solution to a destination.

H1136
ELECTROLYTIC DEPOSITION AND RECOVERY OF SILVER

Stuart K. Janikowski, Idaho Falls, Id., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 29, 1991, Ser. No. 800,291
Int. Cl.[5] C25D *3/46*
U.S. Cl. 205—263 **13 Claims**



1. A method for electroplating silver, comprising:

(a) providing an electrolyte solution comprising an alkali hydroxide and an amine;

(b) providing a pair of electrodes immersed in said solution;

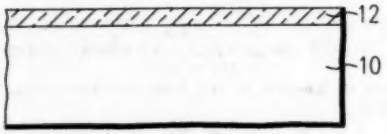
(c) attaching a source of silver to the anode of said electrodes; and

(d) applying a DC potential across said electrodes.

H1137
WAFER BONDING TECHNIQUE FOR DIELECTRIC ISOLATION PROCESSING

William G. Easter, Reading, and Richard H. Shanaman, III, Myerstown, both of Pa., assignors to American Telephone and Telegraph Company, New York, N.Y.

Filed Nov. 5, 1990, Ser. No. 608,955
Int. Cl.[5] G01N *33/18*
U.S. Cl. 437—62 **15 Claims**



1. In a method of forming a dielectrically isolated wafer, replacing the step of growing a polysilicon handle layer with the following steps:

a) forming a layer of conformal material of a thickness sufficient to fill any voids on the wafer surface;

b) planarizing the conformal layer of step a);

c) bonding a silicon substrate to the planarized layer of step b).

H1138
PROCESSING METHOD FOR SUPERCONDUCTING CERAMICS

Ira D. Bloom, Bolingbrook; Roger B. Poeppel, Glen Ellyn, both of Ill., and Brian K. Flandermeyer, Cincinnati, Ohio, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 7, 1990, Ser. No. 519,981
Int. Cl.[5] H01B *12/00*
U.S. Cl. 505—1 **4 Claims**

1. A method of preparing a sintered, metal-oxide superconducting ceramic of the formula $YBa_2Cu_3O_{7-\delta}$ where δ is in the range of about 0.1–0.4, the method comprising the steps of

calcining a mixture of reactants at a temperature sufficient to produce the unsintered ceramic,

distributing a polymeric binder of polyisobutylene or polyisoprene and solvent throughout the unsintered ceramic, the binder being decomposable without forming a residue at temperatures below its ignition point, the solvent being a nonhydroxylic or organic solvent with a volatilization temperature below about 100° C., grinding the unsintered composition including binder to reduce the particle size to about 5–10 microns, and

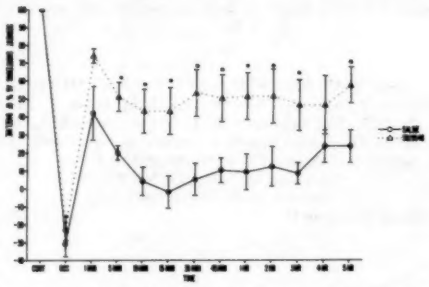
heating the binder and unsintered ceramic to a sintering temperature above the ignition temperature, the heating being carried out under conditions to allow decomposition of the binder and removal of the decomposition products by volatilization prior to the sintering.

H1139
COMBINATION OF A CALCIUM CHANNEL BLOCKER AND THROMBOXANE A_2 RECEPTOR ANTAGONIST OR SYNTHETASE INHIBITOR AND METHOD FOR TREATING ISCHEMIA EMPLOYING SUCH COMBINATION

Gary J. Grover, Stockton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 21, 1988, Ser. No. 222,671
Int. Cl.[5] A01N *43/00*; A61K *31/55*
U.S. Cl. 514—211 **11 Claims**

1. A method for treating ischemia and/or reducing myocardial infarct size in a mammalian specie, which comprises administering to a mammalian specie in need of such treatment an effective amount of a combination of a calcium channel blocker and a thromboxane A_2 receptor antagonist employed



in a weight ratio to each other of from about 0.1:1 to about 10:1.

H1140
ASBESTOS FREE ADHESIVE INSULATION

Stewart H. Greenwood, 135 W. 4300 North, Pleasant View, Utah 84414, and Gordon A. Caldwell, 2435 S. 550 West, Perry, Utah 84302

Filed Feb. 22, 1991, Ser. No. 660,316
Int. Cl.[5] C08J *3/00*
U.S. Cl. 523—180 **1 Claim**

1. An adhesive for bonding a solid fuel propellant to a case in a rocket motor essentially consisting of, by weight:

Bisphenol A/Epichlorohydrin type liquid epoxy resin:	27.8
poly liquid resin curing agent:	51.6
chopped aramid fiber pulp:	up to 2.0
microfine silicon dioxide:	up to 1.0.

H1141
ASPHALT-BLOCK COPOLYMER ROOFING COMPOSITION

Richard Gelles, and Mark A. Berggren, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 705,448, May 24, 1991, which is a continuation-in-part of Ser. No. 553,042, Jul. 16, 1990, Pat. No. 5,051,457. This application Jan. 29, 1992, Ser. No. 827,528
Int. Cl.[5] C08L *95/00*
U.S. Cl. 524—68 **4 Claims**

1. A composition for use in roll roofing membrane applications which comprises:

(a) from about 1 part to about 50 parts per hundred of filler, and

(b) from about 50 parts to about 99 parts per hundred of a bituminous composition which is comprised of

(1) from about 87 to about 92 parts per hundred of a bituminous component having a penetration of greater than about 125 dmm at 25° C., and

(2) from about 7 to about 13 parts per hundred of a hydrogenated block copolymer of a monoalkenyl aromatic hydrocarbon and a conjugated diolefin having a contour arm molecular weight before hydrogenation of from about 80,000 to about 150,000 and a polystyrene content of from about 25% to about 37%, the molecular weight being peak molecular weight determined by gel permeation chromatography.

H1142

OPTICALLY ACTIVE CYCLOBUTYL PYRIMIDINE

William A. Slusarchyk, 19 Richmond Dr., Skillman, N.J. 08558, and Robert Zahler, 16 Park Pl., Princeton, N.J. 08542

Filed Nov. 5, 1990, Ser. No. 608,780
Int. Cl.[5] C07D *239/02*
U.S. Cl. 544—314 1 Claim

1. [1R-(1α(E),2β,3α)]-1-[2,3-bis(hydroxymethyl)cyclobutyl]-5-(2-bromoethenyl)-2,4(1H,3H)pyrimidinedione.

H1143

REDUCTION OF RESIDUAL ORGANIC CHLORINE IN HYDROCARBYL AMINES

Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 15, 1991, Ser. No. 775,383
Int. Cl.[5] C07C *209/08*
U.S. Cl. 564—498 24 Claims

1. A process for reducing residual organic chloride in a hydrocarbyl amine wherein said hydrocarbyl amine is prepared by any process for chlorinating a hydrocarbyl group followed by reaction with an amine wherein the improvement comprises contacting said hydrocarbyl amine with a chlorine-displacing nucleophile selected from the group consisting of NaSCN, NaCN, NaSPh, and mixtures thereof wherein a portion of the residual organic chloride is converted to an inorganic chloride, and removing said inorganic chloride.

REEXAMINATIONS

FEBRUARY 2, 1993

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,904,883 (1918th)

SEMICONDUCTOR INTEGRATED CIRCUIT HAVING A DC TEST FUNCTION

Hideyuki Iino, and Hidenori Hida, both of Yokohama, Japan, assignors to Fujitsu Limited and Fujitsu Microcomputer Systems Limited, both of Kawasaki, Japan

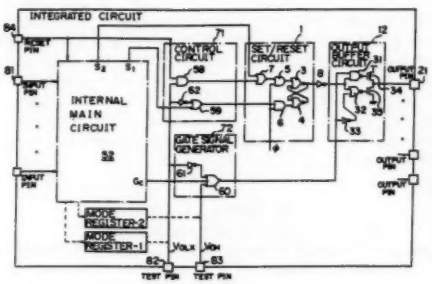
Reexamination Request No. 90/002,554, Feb. 14, 1992.

Reexamination Certificate for Patent No. 4,904,883, issued Feb. 27, 1990, Ser. No. 278,503, Dec. 1, 1988.

Claims priority, application Japan, Dec. 4, 1987, 62-307930

Int. Cl.[5] H03K *17/22, 3/013, 3/027, 31/28*

U.S. Cl. 307—272.3



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3** is confirmed.

1. An integrated circuit receiving an input signal and producing output signal comprising:

an internal main circuit for carrying out various logic operations in accordance with the input signal and producing a first signal and second signal;

a set/reset circuit, operatively connected to said internal main circuit, being set in response to the first signal and reset in response to the second signal in a normal mode;

an output buffer circuit, connected to said set/reset circuit, for producing the output signal in response to an output of said set/reset circuit; and

a control circuit, connected between said internal main circuit and said set/reset circuit, receiving the first signal, a reset signal for initializing said internal main circuit, the first signal, the second signal, and a first test signal, during a DC test mode, said control circuit resetting said set/reset circuit in response to a receipt of the reset signal regardless of the second signal and setting said set/reset circuit in response to a receipt of the first test signal regardless of the reset signal and the first signal.

B1 4,922,464 (1919th)

PORTABLE MIXER FOR PROCESSING FOOD

Karl-Heinz Kamprath, Wiesbaden, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

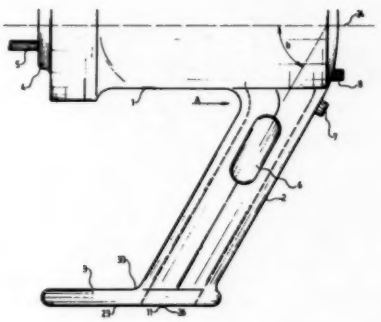
Reexamination Request No. 90/002,680, Mar. 4, 1992.

Reexamination Certificate for Patent No. 4,922,464, issued May 1, 1990, Ser. No. 334,682, Apr. 6, 1989.

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815177

Int. Cl.[5] B01F *15/06*

U.S. Cl. 366—349



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **20–28** and **29** are confirmed.

Claims **2**, **3**, **8**, **9**, **12**, **13** and **14** are cancelled.

Claims **1**, **4–7**, **10**, **11**, **15–18** and **19** are determined to be patentable as amended.

1. An electrically powered portable mixer for processing food[, including a] *comprising* housing [(1)] *structure* accommodating a motor [(19)], a gear box [(20)] and [a] receptacle means [(21)] connected to [the] *said* gear box [(20)] for the fastening of processing tools [(5)], said [housing having a] *motor, said gear box and said working tool receptacle means being successively arranged in the* longitudinal [axis] *direction* (24) [a handle (2) for holding the portable mixer formed on said housing and extending transversely to said longitudinal axis (24)] of said housing [(1)] *structure*,

[at least one air duct (22) in said] handle [(2) to direct said cooling air towards] *structure extending transversely to the longitudinal direction* (24) *of* said housing [(1) from the outside and/or away from said housing (1), and air vent structure (11) on] *structure* said handle [(2) in communication with said air duct (22) for the passage of] *structure being formed on the upper area of said housing structure opposite said working tool receptacle means and including air duct structure and air vent structure through which* cooling air [through the] *is guided to said housing structure from outside or away from said* housing [(1)] *structure* for cooling [the] *said* motor [(19)] , *and*

arm structure extending in the same direction as said handle structure and transversely to said longitudinal direction (24) *of said housing structure and in the lower area of said housing structure more proximate to said working tool receptacle*

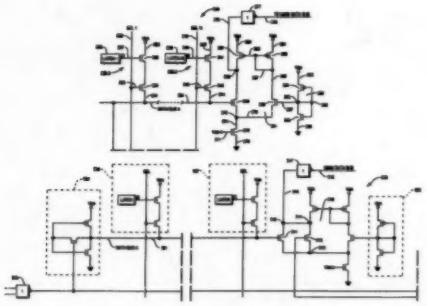
means than said handle structure, said arm structure including further air duct structure and further air vent structure at its end remote from said housing structure for discharge of cooling air away from said housing structure or for supply of cooling air to said housing structure.

B1 5,030,857 (1920th)

HIGH SPEED DIGITAL COMPUTER DATA TRANSFER SYSTEM HAVING REDUCED BUS STATE TRANSITION TIME

Ikuo J. Sanwo, San Marcos; Gregory H. Milby, San Diego, and Quynh-Giao X. Le, Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Reexamination Request No. 90/002,560, Feb. 18, 1992.
Reexamination Certificate for Patent No. 5,030,857, issued Jul. 9, 1991, Ser. No. 398,563, Aug. 25, 1989.
Int. Cl.[5] H03K *19/017, 19/092, 19/096;* **G11C** *15/49*
U.S. Cl. 307—475



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–20** are cancelled.

[1. A high speed digital computer data transfer system having reduced bus state transition time comprising:
a data transfer bus;
a clamping pre-charger coupled to said bus for pre-charging and maintaining said bus at a first logic level;
at least one bus interface logic circuit coupled to said bus capable of selectively placing a second logic level voltage on said bus representing a logic high data state of said computer data transfer system; and
converter/output means coupled to said bus for converting bus voltages at the first logic level to a third logic level representing a logic low data state of said computer data transfer system, and for outputting data at either said second or third logic levels;
said first logic level being higher than said third logic level.**]**

B1 5,036,804 (1921st)

COOLING SYSTEM FOR FOUR STROKE OUTBOARD MOTOR

Yasuhiko Shibata, Shizuoka, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Reexamination Request No. 90/002,662, Mar. 9, 1992.
Reexamination Certificate for Patent No. 5,036,804, issued Aug. 6, 1991, Ser. No. 516,079, Apr. 27, 1990.
Claims priority, application Japan, Apr. 28, 1989, 1-111850
Int. Cl.[5] F02B *75/18*
U.S. Cl. 123—41.74

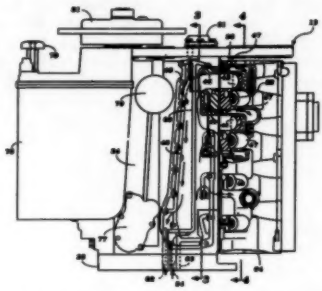
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 3–5, 7** and **8** are determined to be patentable as amended.

Claims **2** and **6**, dependent on an amended claim, are determined to be patentable.

New claims **9–24** are added and determined to be patentable.

1. A cooling system for a four-cycle internal combustion engine having a cylinder block in which at least one cylinder



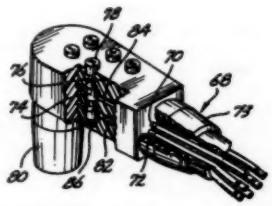
bore is formed, a cylinder head closing said cylinder block and formed with an exhaust passage for discharge of exhaust gases from said cylinder bore, said exhaust **[**passages**]** *passage passing* through a lower face of said cylinder head and communicating with an exhaust manifold formed *integrally* in said cylinder block, a cooling jacket in said cylinder block for cooling said cylinder bore, a cooling jacket in said cylinder head for cooling said exhaust passage, and means for introducing coolant first to said cylinder head cooling jacket and from said cylinder head cooling jacket to said cylinder block cooling jacket.

B1 5,056,686 (1922nd)

BEVERAGE DISPENSING SYSTEM

Charles C. Jarrett, Bellevue, Wash., assignor to Nutri-Fruit, Inc., Bellevue, Wash.

Reexamination Request No. 90/002,694, Apr. 3, 1992.
Reexamination Certificate for Patent No. 5,056,686, issued Oct. 15, 1991, Ser. No. 530,116, May 29, 1990.
Continuation-in-part of Ser. No. 372,837, Jun. 27, 1989, abandoned
Int. Cl.[5] B67D *5/56*
U.S. Cl. 222—129.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1, 2, 7, 13, 18** and **23** are determined to be patentable as amended.

Claims **3**, **4** to **6**, **8** to **12**, **14** to **17**, and **19** to **22**, dependent on an amended claim, are determined to be patentable.

1. A beverage dispensing system comprising:

a plurality of containers for storing beverage concentrate;

a plurality of proportion pumps, each said proportion pump having a fluid drive side and a fluid pumping side, said fluid drive side having a fluid inlet and a fluid outlet, and said pumping side having a concentrate inlet and a concentrate outlet;

means for coupling said fluid inlet of each of said pumps to a source of pressurized fluid;

means for coupling each said pump concentrate inlet to a separate one of said concentrate containers;

a plurality of pairs of *flexible* fluid supply and *flexible* concentrate supply lines, said fluid supply line and said concentrate supply line of each said pair of supply lines respectively coupled to a fluid outlet and a concentrate outlet of one of said proportion pumps, each said pair of supply lines coupled to a separate one of said proportion pumps;

a dispensing head to which said pairs of fluid and concentrate supply lines are attached, said dispensing head having an outlet through which fluid and beverage concentrate from said supply lines [is] *are* discharged, said dispensing head including a plurality of valve means, each said valve means associated with a separate pair of said fluid and concentrate supply lines for selectively controlling the discharge of fluid from said associated fluid supply line so that, when a selected valve means is opened, fluid flows from said associated fluid supply line, allowing fluid to flow through said respective proportion pump and causing concentrate to flow from said concentrate supply line and be discharged concurrently with fluid from said dispensing head outlet.

REISSUES

FEBRUARY 2, 1993

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 34,170
SPINNING UNIT PIECING PROCESS FOR PRODUCING FEED SPOOLS

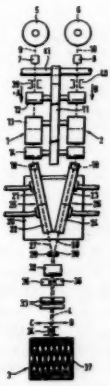
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Original No. 4,790,130, dated Dec. 13, 1988, Ser. No. 105,813, Oct. 8, 1987. Application for reissue Dec. 12, 1990, Ser. No. 626,548

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1986, 3634464

Int. Cl.[5] D01H *15/00*

U.S. Cl. 57—261 **47 Claims**



15. A piecing process for piecing yarn components formed in a unit of the type having drafting means for supplying a plurality of drafted slivers, false twisting means for forming a plurality of yarn components from the plurality of drafted slivers, and joint feed spool forming means for forming feed spools with the plurality of yarn components jointly wound adjacent one another, which feed spools can be used in subsequent twisting operations or the like, said piecing process comprising the sequential steps of:

starting the supply of the plurality of drafted slivers by the drafting means,

inserting the plurality of drafted slivers into the false twisting means;

gripping the plurality of yarn components at the outlet end of the false twisting means, and

transferring the plurality of yarn components to the joint feed spool forming means.

Re. 34,171
MEDICATION CARTS AND CASSETTES

Jerome M. Romick, 170 N. Drexel Ave., Columbus, Ohio 43209, and Duane Beardsley, 2552 Ridgewood Trail, Berrien Springs, Mich. 49103

Original No. 4,616,890, dated Oct. 14, 1986, Ser. No. 691,272, Jan. 14, 1985. Continuation of Ser. No. 256,919, Oct. 12, 1988. Application for reissue Jun. 21, 1991, Ser. No. 719,077

Int. Cl.[5] A47B *47/00*

U.S. Cl. 312—257.1 **10 Claims**

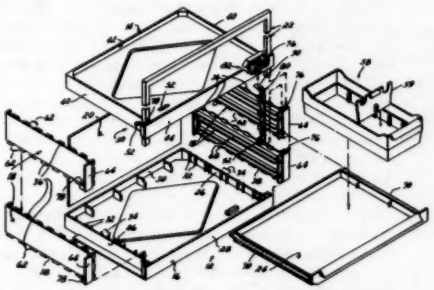
1. A medication cassette for use in a medication cart comprising

top, bottom, a plurality of side, and back panels,

connecting means on said side panels and said top and bottom panel which cooperate to position the side panels with respect to said top and bottom panels,

said connecting means including a plurality of interlock tabs on said side panels adapted to cooperate with interlock tabs on other side panels whereby said side panels may be stacked on top of each other to provide a single planar wall surface, said interlock tabs extending above and below each side panel and spaced apart a distance slightly greater than the width of a interlock tab,

said connecting means on said top and bottom panels including ribs that define channels which receive interlock tabs on said side panels,



[a U-shaped frame] *a pair of vertical posts* adapted to engage said side, top and bottom panels to hold said side, top and bottom panels rigidly together,

engagement means on said top, bottom and side panels for receiving said [channel frame means] *vertical posts,*

means for securing said back panel with respect to said bottom, top and side panels, and

a medication receptacle adapted to be inserted in said cassette.

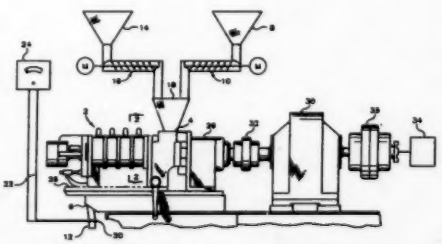
Re. 34,172
CONTINUOUS MIXER

J. S. Gwinn, and Michael J. Miller, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 4,767,216, dated Aug. 30, 1988, Ser. No. 489,991, Apr. 29, 1983. Application for reissue Nov. 15, 1991, Ser. No. 793,935

Int. Cl.[5] B01F *7/08*

U.S. Cl. 366—85 **18 Claims**



11. A process for melting a particulate material, said particulate material [being characterized as a thermoplastic resin]

comprising a polyolefin having a flux point of between about 100° C. and 400° C.; said process comprising the steps of

(a) introducing the particulate material into at least one screw feeder, and

(b) forcing the particulate material by the action of the at least one screw feeder into a mixing chamber having the following characteristics

(i) the mixing chamber is formed by a first generally cylindrical chamber and a second generally cylindrical chamber which are interconnecting and parallel to each other in a housing;

(ii) the at least one screw feeder is positioned at a first end of the mixing chamber;

(iii) a discharge orifice is positioned near the second end of the mixing chamber;

(iv) a first rotor is positioned in the first generally cylindrical chamber, said first rotor being characterized by a first tip beginning at the first end of the mixing chamber and following a helical path spiraling in a first rotational direction at a pitch greater than about half of a mixing chamber length and a second tip beginning at the end of the first tip and following a helical path spiraling in a second rotational direction at a pitch greater than about half of a mixing chamber length, said first tip meeting with said second tip at an apex which is positioned at a distance from the first end of the mixing chamber of between about 30% and about 70% of the distance to the second end of the mixing chamber;

(v) a second rotor is positioned in the second generally cylindrical chamber, said second rotor being characterized by a first tip beginning at the first end of the mixing chamber and following a helical path spiraling in the second rotational direction at a pitch greater than about half of a mixing chamber length and a second tip beginning at the end of the first tip and following a halical path spiraling in the first rotational direction at a pitch greater than about half of a mixing chamber length, said first tip meeting with said second tip at an apex which is positioned at a distance from the first end of the mixing chamber of between about 30% and about 70% of the distance to the second end of the mixing chamber, the difference in the positioning of the apex of the first rotor and the apex of the second rotor being at least 20% of the distance between the first end of the mixing chamber and the second end of the mixing chamber; and

(c) counterrotating the first rotor and the second rotor to melt the particulate material, said first rotor and said second rotor being rotated in the direction away from the first rotor apex and the second rotor apex so that the first rotor second tip and the second rotor second tip are rotating in the direction of the discharge orifice as they sweep by each other.

Re. 34,173

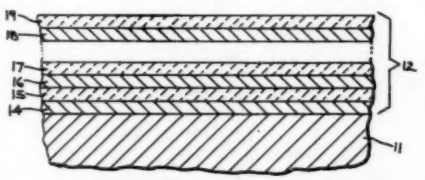
MULTI-LAYER WEAR RESISTANT COATINGS

Susan M. Kerber, Sussex, Wis., assignor to Midwest Research Technologies, Inc., Milwaukee, Wis.

Original No. 4,904,542, dated Feb. 27, 1990, Ser. No. 255,454, Oct. 11, 1988. Application for reissue Oct. 31, 1990, Ser. No. 606,243

Int. Cl.[5] B32B *15/04*

U.S. Cl. 428—610 **20 Claims**



5. A wear resistant coating on a *major* surface of a substrate for protecting against particle induced erosion and water induced erosion and corrosion, said coating having a first set of layers of a ceramic material interleaved with a second set of layers of a metallic material to form a coating with at least four layers, *in which the layers of metallic material are as thick or thicker than the layers of ceramic material, and*

wherein the interface between adjacent layers is a graded transition of the concentration of the two materials.

PLANT PATENTS

GRANTED FEBRUARY 2, 1993

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

8,120

AFRICAN VIOLET PLANT NAMED VIENNA

Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,505
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—69.2 **1 Claim**

1. A new and distinct cultivar of African violet named Vienna, as described and illustrated, and particularly characterized by its extra large growth habit (35–45 cm in diameter); purplish blue, single violet-shaped flowers; strong stems which curve toward the center to form a bouquet above the leaves; profuse flowering; large, medium green, spear-shaped leaves; flowering 12–13 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

8,121

AFRICAN VIOLET PLANT NAMED LITTLE AZURITE

Reinhold Holtkamp, Sr., Blumenstrasse 28, D 4242 Rees-Haffen, Fed. Rep. of Germany

Filed Jul. 26, 1991, Ser. No. 736,506
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—69.2 **1 Claim**

1. A new and distinct cultivar of African violet named Little Azurite, as described and illustrated, and particularly characterized by its miniature growth habit; single violet-shaped, purplish blue flowers with white edges; strong stems which curve toward the center to form a compact bouquet above the leaves; profuse and continuous flowering; medium green, spear-shaped leaves; flowering 10–11 weeks after planting of unrooted shoot, and by its long lasting and non-dropping flowers.

8,122

CARNATION PLANT NAMED CFPC AMETHYST

Walter H. Jessel, Jr., Salinas, Calif., assignor to California Florida Plant Co., L.P., Salinas, Calif.

Filed Mar. 28, 1991, Ser. No. 678,550
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—70.5 **1 Claim**

1. A new and distinct variety of carnation plant, substantially as shown and described, characterized particularly by flowers of attractive mauve coloration.

8,123

CARNATION PLANT NAMED CFPC CHERIÉ5

Walter H. Jessel, Jr., Salinas, Calif., assignor to California Florida Plant Co., L.P., Salinas, Calif.

Filed Mar. 28, 1991, Ser. No. 678,853
Int. Cl.[0] A01H *5/00*
U.S. Cl. Plt.—72.1 **1 Claim**

1. A new and distinct variety of carnation plant, substantially as shown and described, characterized particularly by flowers of attractive pink coloration.

8,124

CHRYSANTHEMUM PLANT — BAYFRANK CULTIVAR

Jacques C. M. van der Knapp, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands

Filed Jun. 25, 1991, Ser. No. 720,663
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—82.4 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Bayfrank, substantially as herein shown and described, which:

(a) exhibits attractive relatively large anemone pink-purple flowers having a darker center,
(b) bears flowers in a generally flat capitulum configuration when mature,
(c) exhibits a flower response period of approximately eight weeks,
(d) forms attractive dark green foliage, and
(e) has the ability to produce flowers of commercially acceptable quality throughout the year in a cut mum production program.

8,125

POINSETTIA PLANT NAMED 268 WHITE

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed Jul. 15, 1991, Ser. No. 730,350
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—86.2 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, characterized by its large white, erect flower bracts, and self-branching traits.

8,126

POINSETTIA PLANT NAMED C-27 WHITE

Franz Fruehwirth, Encinitas, Calif., assignor to Paul Ecke Ranch, Inc., Encinitas, Calif.

Filed Jul. 15, 1991, Ser. No. 730,351
Int. Cl.[5] A01H *51/00*
U.S. Cl. Plt.—86.2 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, characterized by its large white, erect flower bracts, and stiff stems.

8,127

POINSETTIA PLANT 'GOLDFINGER'

Jan Man, Meerlandenweg 46, 1187 ZR Amstelveen, Netherlands

Filed Aug. 14, 1991, Ser. No. 745,217
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—86.4 **1 Claim**

1. A new and distinct Poinsettia cultivar, substantially as herein shown and described, distinguished by its vigorous and self-branching growth habits, medium to tall height and bright red flower bracts.

8,128

VARIETY OF GERANIUM NAMED HOT PINK SATISFACTION

Scott C. Trees, Nipomo, Calif., assignor to Geo. I. Ball, Inc., West Chicago, Ill.

Filed Aug. 12, 1991, Ser. No. 743,747
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct variety of Geranium plant, substantially as shown and described.

8,129

ANTHURIUM PLANT 'GEORGUSIS WHITE NUMBER 1'

James J. Georgusis, Hilo, Hi., assignor to Oglesby Plant Laboratories, Inc., Altha, Fla.

Filed Aug. 5, 1991, Ser. No. 740,499
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct cultivar of Anthurium, substantially as described and illustrated herein, characterized particularly as to novelty by its compact form as well as its freely branching and flowering, the sharp contrast between the dark green foliage and numerous white flowers providing a cultivar well suited as a flowering pot plant having good resistance to the traditional Anthurium diseases and no unusual susceptibility to insects.

8,130

SPATHIPHYLLUM 'LEPRECHAUN'

David Fell, Hawaiian Sunshine Nursery, Hilo, Hi. 96720

Filed Feb. 25, 1991, Ser. No. 659,884
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct cultivar of Spathiphyllum as herein shown and described, characterized particularly as to novelty by the larger size than the seed parent, with darker color leaves and similar finish, greater hardiness than the seed parent, free flowering production, with clumping habit and shape of leaf of the pollen parent, together with growth speed of the latter, hybrid vigor being better than both parents.

8,131

ANTHURIUM 'GEORGUSIS PINK NUMBER 1'

James J. Georgusis, Hilo, Hi., assignor to Oglesby Plant Laboratories Inc., Altha, Fla.

Filed Aug. 5, 1991, Ser. No. 740,498
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—88.1 **1 Claim**

1. A new and distinct Anthurium cultivar substantially as herein shown and described characterized particularly as to novelty by the red-purple flower color pigment irregularly dispersed over the white background becoming more evenly distributed as the flower matures, the freely branching and flowering form of the plant, dark green leaves contrasting with light pink flower color, and the substantially for commercial distribution as a flowering pot plant.

PATENTS

GRANTED February 2, 1993

ERRATA

For CLASS	See PATENT NO.
492-024	5,182,840
602-010	5,183,036
271-003	5,183,239
271-003	5,183,240
271-012	5,183,241
271-014	5,183,242
279-156	5,183,272
239-394	5,183,322
400-605	5,183,333
411-029	5,183,357
411-059	5,183,358
411-188	5,183,359
411-400	5,183,360
412-016	5,183,361
441-079	5,183,367
409-179	5,183,373
409-286	5,183,374
410-035	5,183,375
433-019	5,183,388
433-215	5,183,397
434-227	5,183,398
434-322	5,183,399
433-076	5,183,414
433-080	5,183,415
433-166	5,183,416
128-003	5,183,464
504-243	5,183,492
252-524	5,183,601
252-587	5,183,602
424-078	5,183,687
437-230	5,183,795
501-152	5,183,801
514-049	5,183,882
324-158	5,184,162
355-297	5,184,194
257-471	5,184,198
257-077	5,184,199

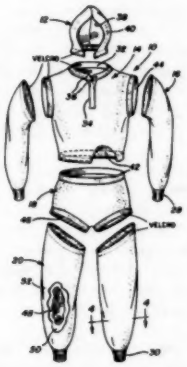
257-053 5,184,200
257-266 5,184,201
257-390 5,184,202
257-370 5,184,203
257-629 5,184,204
257-765 5,184,205
257-762 5,184,206
257-668 5,184,207
257-666 5,184,208
257-679 5,184,209
257-664 5,184,210
257-706 5,184,211

PATENTS

GRANTED FEBRUARY 2, 1993

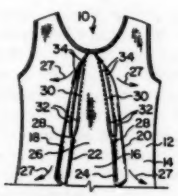
GENERAL AND MECHANICAL

5,182,812
LAYERED REDUCING GARMENT
Irma J. Goldsby, 1710 N. 42nd St., E. St. Louis, Ill. 62204
Filed Mar. 28, 1991, Ser. No. 676,378
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—79 **1 Claim**



1. A weight reducing garment comprising a hollow flexible member adapted to enclose a portion of the human anatomy, said member including an inner layer of absorbent cotton fabric, a middle layer of air and moisture impervious flexible vinyl plastic and an outer layer of fabric to enable the garment to be worn without observation of the inner and middle layers with the inner layer absorbing body perspiration and the middle layer retaining body heat to subject the portion of the body enclosed by the flexible member to body heat, said hollow flexible member including an upper torso enclosing area and a lower pants portion with the lower end of the upper torso enclosing area being disposed externally of an upper end of the lower pants portion and the upper torso enclosing area including a hood, and sleeves and the lower pants portion including legs, flexible hook and loop pile fastener material detachable connecting the hood, sleeves and legs and detachably connecting a lower end of the upper torso area with an upper end of the lower pants portion while maintaining the imperviousness of the middle layer, the ends of the sleeves and the ends of the legs having knit cuffs thereon for snugly embracing the wrist and ankle areas of the wearer.

5,182,813
NURSING GARMENT
Janice E. Booze, 1919 Wynkoop Dr., Colorada Springs, Colo. 80909
Filed Jan. 27, 1992, Ser. No. 826,438
Int. Cl.[5] A41D *1/20, 1/22*
U.S. Cl. 2—104 **18 Claims**

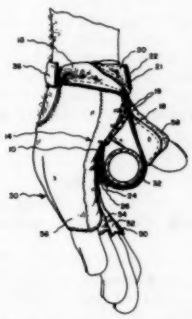


1. A nursing garment in the form of upper body clothing to be worn by a women for breast feeding an infant, said garment including a front, a back, openings for arms, and shoulder portions, said nursing garment including, in combination:

centered on said front of said garment, a substantially vertical, always open, inwardly facing pleat requiring no closure means and formed by, and including, a pair of normally visible, substantially vertical, exterior fold lines, a pair of normally hidden substantially vertical interior fold lines; and

normally hidden, always open, opening means through said front of said garment at at least one of said hidden interior fold lines of said always open, inwardly facing pleat, said normally hidden, always open, opening means being located and adapted to become visible and to provide easy access to the breast of a wearer for breast feeding an infant by folding said exterior fold line portion of said inwardly facing pleat away from the center of said garment.

5,182,814
WEIGHT SUPPORTING GLOVE
Kenneth Christensen, 777 S. 400 East, No. 25, St. George, Utah 84770
Filed Aug. 27, 1990, Ser. No. 572,257
Int. Cl.[5] A41D *19/00*
U.S. Cl. 2—161 A **20 Claims**



1. A weight supporting glove comprising:

a glove including a palm portion having a heel end, a wrist portion adjacent the heel end of the palm portion and adapted to extend around a wearer's wrist, and first fastening means for adjustably securing the wrist portion of the glove around a wearer's wrist;

a flap having an attached portion secured to the wrist portion of the glove at least substantially continuously along the heel end of the palm portion from side to side of the glove and having an unattached distal portion; and

second fastening means for releasibly securing the unattached distal portion of the flap to the palm portion of the glove to form a loop for supporting a weight.

5,182,815
ATHLETIC PANTS
Margaret B. Young, 75 Deerpath, Oldsmar, Fla. 34677-0000
Filed Jun. 3, 1991, Ser. No. 709,500
Int. Cl.[5] A41B *9/02*
U.S. Cl. 2—406 **10 Claims**

1. Athletic pants comprising in combination:

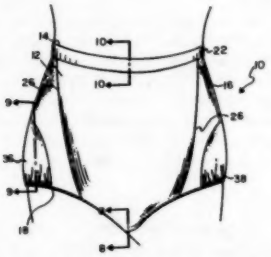
basic panel means having an upper front edge, an upper rear edge and sides, the basic panel means extending from the

338-959 O.G.-93-2

upper front edge at the front of the wearer's waistline, downwardly around the wearer's crotch, then upwardly to the upper rear edge at the back of the wearer's waistline with generally vertical stitching to couple the panel means together, the basic panel means being fabricated of a knit fabric from extensible yarn;

an elastic waistband coupled to the upper front and rear edges of the basic panel means;

a pair of support panels with lateral edges, the support panels having upper edges extending downwardly from the upper front edge and upper rear edge and stitched at their lateral edges to the basic panel means, the basic panel



means being constructed of a knit fabric from extensible yarn and with the support panels also being constructed of a knit fabric from an extensible yarn, the fabric of the basic panel means being of a first mesh and the fabric of the support panels being of a second mesh with the second mesh of the support panels being of a greater elasticity than that of the basic panels means; and

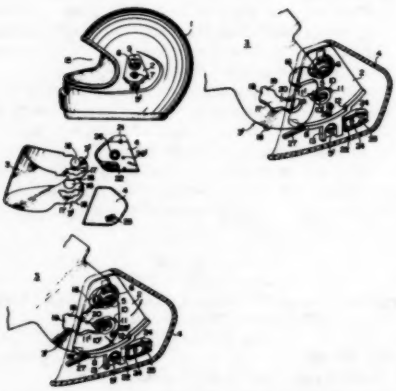
a pair of pocket panels stitched over the sides of the basic panel means, the pocket panels being shaped in an inverted U-shape configuration and with an extensible lower edge having an elastomeric hem at its lower edge thereof to cooperate with the basic panel means to form a pocket opening.

5,182,816

SHIELD MOUNTING STRUCTURE FOR HELMET

Michio Arai, 1-164, Horinouchi, Ohmiya-shi, Saitama-ken, Japan

Filed May 30, 1991, Ser. No. 707,379
Claims priority, application Japan, Jun. 14, 1990, 2-156061
Int. Cl.[5] A42B *3/02*
U.S. Cl. 2—424 **5 Claims**



5. A shield mounting structure for a helmet of the type having opposite right and left outer side faces and a front opening, said shield mounting structure comprising:

a) a shield pivotally mounted to said helmet for movement between an open and a closed position, said shield having a right side and a left side, each side having a mounting portion, and each said mounting portion having a mounting hole and a stopper part,

b) a base plate mounted to each of said right and left side faces of said helmet, each said base plate including:

i) pivot shaft means projecting therefrom for pivotally mounting said shield thereon, said pivot shaft means having an axis and said pivot shaft means being engageable with one said mounting hole, and

ii) stopper means projecting therefrom for restricting the range of pivoting motion of said shield, said stopper means being engageable with one said stopper part,

c) resilient shield keep cover means associated with each said base plate for preventing dislodgement of said shield from said base plates, each said shield keep cover means including:

i) upper and lower portions thereof fixed to one of a respective said base plate and said helmet such that a central part of the shield is pushed and expanded outwardly to form a gap between the shield and the free surface of the pivot shaft when a force is applied to said shield in a removal direction, to permit the shield to pass through said gap, only when said shield in the upper limit open position, and

ii) a front edge, and

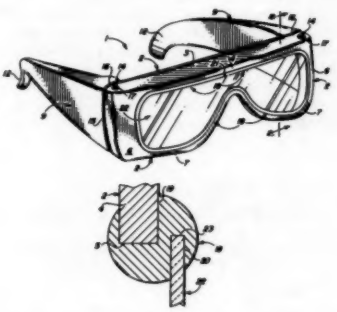
d) an opening formed between each outer side face of the helmet and said shield keep cover means, which permits the insertion and removal therethrough of one said mounting portion.

5,182,817

GOGGLES HAVING AN EXTRUSION-MOUNTED LENS

Brian Branum, 1301 Willow Way, Garland, Tex. 75043

Filed Jul. 12, 1991, Ser. No. 729,483
Int. Cl.[5] A61F *9/02*
U.S. Cl. 2—439 **6 Claims**

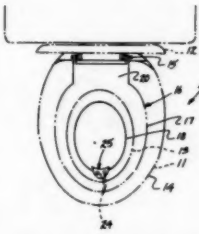


1. Goggles having an extrusion-mounted lens, comprising a frame having a viewing opening bordered by an inside edge, temple pieces carried by said frame in hinged relationship, a flexible, resilient extruded lens mount having a frame slot for removably receiving the inside edge of said viewing opening of said frame and a lens slot for removably receiving said lens and removably mounting said lens in said viewing opening of said frame, said frame slot and said lens slot provided in offset, substantially parallel planes in said lens mount and extending at leas to a plane bisecting said lens mount perpendicular to said parallel planes.

5,182,818
CHILD COMMODE SEAT APPARATUS

John P. Nawoj, 153 Main St., Sayreville, N.J. 08872

Filed Aug. 6, 1991, Ser. No. 740,710
Int. Cl.[5] A47K 13/00
U.S. Cl. 4—235 2 Claims



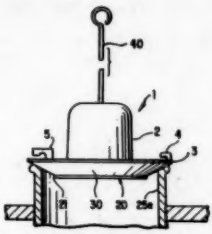
1. A child commode seat apparatus, comprising,
a commode, the commode including a commode top surface, including an inner continuous edge spaced interiorly of an outer continuous edge, and
a commode seat mounted upon the top surface, the commode seat pivotally mounted about an axle, the axle mounted upon a rear end portion of the top surface, and
a child insert seat pivotally mounted to the axle interiorly of the commode seat, the insert seat including a seat inner edge positioned interiorly of the inner continuous edge, and
a seat outer edge positioned between the inner continuous edge and the outer continuous edge, and
the inner seat including a central tubular conduit projecting downwardly from the inner edge, and
the inner edge defining an elliptical central opening, and
a forward end of the insert seat diametrically spaced from the axle and includes a plurality of seat apertures, and
a urine deflector shield selectively mounted to the forward end, wherein the shield includes a planar bottom wall, the planar bottom wall including a plurality of mounting legs, the plurality of mounting legs selectively received within the seat apertures, and
the shield includes a vertical wall extending above the planar bottom wall, wherein the vertical wall includes a convex deflector cavity in confrontation with the central opening, the deflector cavity including an "S" shaped interior cavity wall extending below the planar bottom wall of the shield, the vertical wall including a vertical wall upper end spaced above the planar bottom wall, and
a splash plate, the splash plate including an apertured splash wall complementarily received forwardly of the vertical wall and within the convex deflector cavity, the splash plate wall including a matrix of apertures directed therethrough, and the splash plate further including a splash plate cavity formed at an upper terminal end of the splash plate to receive the vertical wall upper end therewithin.

5,182,819
UNIVERSAL COMMODE STOPPER

William S. Shaw, 7606 Silvercrest Cir., Austin, Tex. 78757

Filed Apr. 26, 1991, Ser. No. 691,863
Int. Cl.[5] E03D 1/35
U.S. Cl. 4—393 14 Claims

1. A valve stop for connecting between the valve actuator assembly and the fluid outlet of a sanitary flush tank comprising a cylindrical hollow body of rigid material, said cylindrical hollow body supporting a gasket at its lower end to effect a seal against said fluid outlet, said cylindrical hollow body further comprising at least one support means for said gasket, and at least two alternative connecting devices disposed on

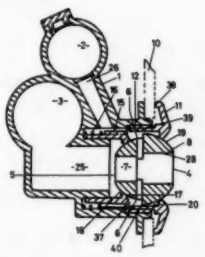


said cylindrical hollow body for connecting said cylindrical hollow body to said valve actuator assembly.

5,182,820
NOZZLE MOUNTINGS

Kipley R. Marks, 61 St Heliers Bay Rd., Auckland, New Zealand

Filed Apr. 29, 1991, Ser. No. 692,896
Claims priority, application New Zealand, Mar. 5, 1989, 228974; Australia, Mar. 5, 1990, 54744/90
Int. Cl.[5] A61H 33/02, 9/00
U.S. Cl. 4—541.4 7 Claims



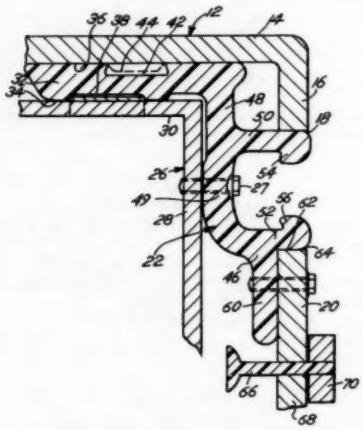
1. A nozzle mounting comprising a body, a main air passageway and a main water passageway in said body, a nozzle member having outer walls of spherical form and a nozzle passageway passing therethrough, a receptacle in said body to receive said nozzle member, retaining means to retain said nozzle member in said body sealing the contact with parts of said outer walls, while permitting manipulative rocking movement of said nozzle member over a range of movement, the nozzle member having at least one water entry for water, at least one air entry for air, and at least one exit for combined water and air, said air entry being open to said main air passageway and said water entry being open to said main water passageway, and fixing means for fixing said body to an opening in a vessel, the construction and arrangement being such that on water entering said nozzle passageway through said water entry air from said main air passageway is entrained in the water from said main water passageway and the combined air and water mixture discharged from said nozzle passageway in a manner such that the disposition of said nozzle passageway is not altered by the discharge of said mixture but said nozzle member may be manually rocked to direct the flow of mixed air and water in a desired direction within said range of movement, while said parts of said outer walls are maintained in contact with said retaining means wherein said retaining means comprise a spring loaded seal and a retaining member mounted to retain said nozzle member in said receptacle with said nozzle member held in contact with said retaining member by said spring loaded seal.

5,182,821

PANEL CONSTRUCTION FOR BATHING TUB

Charles D. Bufford, Blue Hill, and James M. Gruidel, Hastings, both of Nebr., assignors to Dutton-Lainson Company, Hastings, Nebr.

Filed Sep. 24, 1991, Ser. No. 765,364
Int. Cl.[5] A47K 3/16
U.S. Cl. 4—592 2 Claims



1. An improved bathing tub construction comprising, in combination:

a support frame;

a rigid molded tub enclosure defined by a shaped wall and having a periphery with a horizontal run, a partially depending vertical run smoothly connected to the periphery and an edge surface defining the lower external rim of the periphery;

at least one rigid vertical panel for enclosing a side of the frame;

a rigid tub assembly member supported on the frame and configured to receive and support the tub enclosure at the periphery of said enclosure to define a first seam, said assembly member further including a vertical panel support section for support of the vertical panel and thereby defining a second seam, and an elongated outside channel intermediate the seams; and

a flexible trim member insertable in the outside channel to cover, seal and provide a generally flush surface for the channel over the seams between the assembly member, vertical panel and tub enclosure;

said rigid tub assembly member including a first horizontal section having an upper surface and a lower surface, the lower surface positioned on the frame, said upper surface for engaging the horizontal run of the tub enclosure;

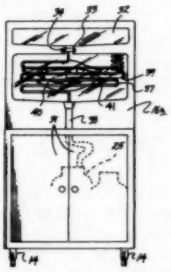
said rigid tub assembly member further including a generally vertical panel support section with the elongated outside channel defined between the sections, said outside channel being generally U-shaped in cross section and defined by an upper leg and a spaced lower leg, the outside surface of the upper leg cooperative with the edge surface of the tub enclosure to define the first seam, the outside surface of the lower leg cooperative with the vertical panel to define the second seam, said seams and legs defining a generally vertical, planar outside surface and the trim member being cooperatively engaged between the legs and fitting over both the first and second seams to further define a generally planar, vertical outside surface.

5,182,822

CHILD'S SINK APPARATUS

Dwayne L. Cyr, 17-733 Oak La., Lady Lake, Fla. 32159, and Dale A. McCollom, 35918 Union Lake Rd. Apt. 106, Mt. Clemens, Mich. 48043

Filed Apr. 9, 1991, Ser. No. 682,337
Int. Cl.[5] A47K 1/00
U.S. Cl. 4—625 1 Claim



1. A child's sink apparatus, comprising,

a cabinet including a top wall, spaced side walls, a floor underlying and coextensive with a top wall,

and

a rear wall extending from the floor to the top wall in orthogonal communication with rear edges of each of the side walls, with the top wall including a rear wall extension flange coextensive with the rear wall and orthogonally directed upwardly of the top wall,

and

a concave sink directed downwardly from the top wall, the concave sink including a drainage conduit, the drainage conduit in fluid communication with an underlying first removable reservoir conduit mounted within the cabinet upon the floor,

and

a second reservoir container, the second reservoir container including an output conduit directed from within the second reservoir container to the top wall,

and

a "J" shaped upper section conduit in fluid communication with the output conduit overlying the sink to direct fluid flow from the second reservoir container to the sink,

and

a cylindrical cup cavity directed orthogonally downwardly from the top wall, with the cup cavity including a cup cavity floor, the cup cavity floor including a spring mounted thereon, and a series of nested stacked inverted cup members mounted on the spring to bias the cup members to the top wall for access of the cup members by an individual,

and

a closure door hingedly mounted adjacent each side wall defining a forward wall of the cabinet coextensively between the top wall and the floor,

and

the rear wall extension flange includes a third reservoir container, the third reservoir container is transparent and includes a transparent output conduit, the output conduit including a valve member to effect selective flow from the reservoir container through the output conduit, and a transparent cover member, the transparent cover member receiving the output conduit, and defining a cover cavity therewithin defined between the transparent cover and a forward surface of the rear wall extension flange, and a serpentine transparent lower conduit in fluid communication with the third reservoir output conduit directing fluid flow from the third reservoir output conduit through the serpentine transparent lower conduit, and the transparent

lower conduit including an uppermost horizontal extent, and the uppermost horizontal extent including a series of apertures directed therethrough to effect metered fluid flow through the apertures within the transparent cover cavity, and a toothbrush member pivotally mounted within the transparent cover cavity, the toothbrush member including a toothbrush handle, the toothbrush handle including a pivot axle directed through the toothbrush handle orthogonally mounted to the forward surface of the rear wall extension flange, and a biasing spring mounted between the pivot axle and a rear terminal end of the toothbrush handle, with the biasing spring mounted between the toothbrush handle and a bottom surface of an overlying horizontal extent of the transparent cover cavity, and the toothbrush member including a toothbrush head mounted on the toothbrush handle, the toothbrush head positioned in alignment and below the apertures to effect oscillation of the toothbrush member upon fluid flow directed through the output conduit and the apertures, and a bristle matrix mounted on a forward face of the toothbrush head, wherein the bristle matrix is in sliding communication with the forward surface of the rear wall extension flange.

5,182,823

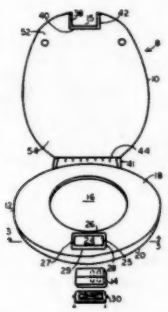
TOILET SEAT CLOCK APPARATUS

Ron Alsip, P.O. Box 584, Raynham, Mass. 02767

Filed Oct. 29, 1991, Ser. No. 783,987

Int. Cl.[5] E03D *11/00*

U.S. Cl. 4—661 **9 Claims**



6. A clock apparatus and toilet seat comprising;

a) a clock means for displaying the time of day and being sealably mounted in a mounting chamber formed in the toilet seat, comprising;

i) a display panel for displaying time;

ii) a time-keeping apparatus for operating the display panel;

iii) a lens means for enclosing a top of the mounting chamber and comprising a transparent cover, the lens means including sealing means for sealably enclosing the chamber wherein the housing means ad display panel are mounted in the chamber to be observed by a user;

iv) a base plate for enclosing a base of the mounting chamber;

b) a housing means for containing the time-keeping apparatus comprising a housing section including an upper portion comprising a lens and a lower portion for enclosing the time-keeping apparatus.

5,182,824

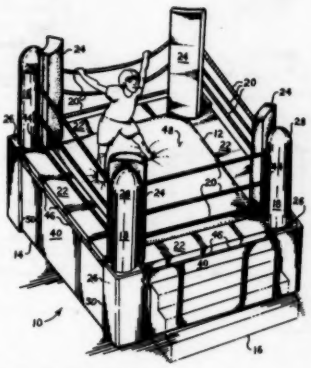
WRESTLING BED

Nickolas A. Cipriano, 1021 Marlyn Rd., Philadelphia, Pa. 19151

Filed Aug. 11, 1992, Ser. No. 928,065

Int. Cl.[5] A47D *11/00*

U.S. Cl. 5—2.1 **19 Claims**



1. A wrestling bed comprising:

a rectangular platform supporting a mattress of standard configuration;

four corner posts defining corners of said rectangular platform and extending upward therefrom;

four peripheral tread pads extending between said corner posts and surrounding said mattress, said mattress having a periphery immediately adjacent said tread pads;

a plurality of peripheral ropes extending between said corner posts and secured thereto, said peripheral ropes overlying said periphery of said mattress and defining a play area thereupon; whereby,

said wrestling bed provides a defined area for vigorous activities by means of said platform, said corner posts, and said retaining ropes and further provides a bed by means of said platform and said mattress.

5,182,825

WATERBED

D. Ray Stinson; Linda D. Stinson, both of 3000 N. Atlantic Ave., #4, Daytona Beach, Fla. 32118; Brian F. Roberts, Deland, Fla.; Steven J. Dahms, Ormond Beach, Fla.; Brian P. Estes, Ponce Inlet, Fla., and Tommy H. Robertson, Port Orange, Fla., assignors to D. Ray Stinson and Linda D. Stinson, both of Daytona Beach, Fla.

Filed Feb. 20, 1991, Ser. No. 658,199

Int. Cl.[5] A47C *27/10*

U.S. Cl. 5—451 **5 Claims**

1. A bed for use in a health-care facility comprising:

a bladder adapted for holding fluid and for supporting a person;

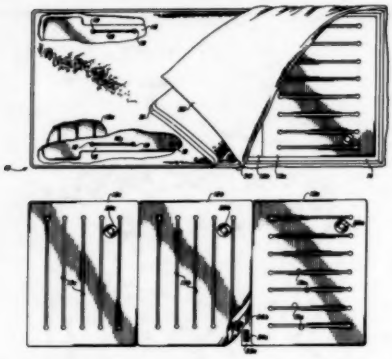
a foam inlay disposed about the periphery of the bladder;

a cover enclosing the foam inlay and the bladder;

a transfer board supporting the cover, the foam inlay and the bladder;

means coupled to the cover for removably securing said bladder to said transfer board;

a plurality of handles on said transfer board for use in transporting the bed; and



a zipper for opening the cover to remove the foam inlay and the bladder.

5,182,826

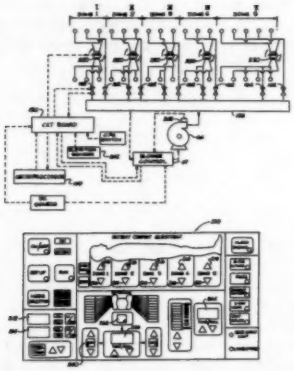
METHOD OF BLOWER CONTROL

James M. C. Thomas, Mt. Pleasant; James R. Stolpmann, Charleston; William T. Sutton, Charleston, and James J. Romano, Charleston, all of S.C., assignors to SSI Medical Services, Inc., Charleston, S.C.

Division of Ser. No. 555,319, Jul. 19, 1990, Pat. No. 5,121,513, which is a continuation-in-part of Ser. No. 321,255, Mar. 9, 1989, abandoned. This application Apr. 29, 1991, Ser. No. 693,918

Int. Cl.[5] A61G *7/057*

U.S. Cl. 5—453 **6 Claims**



1. A method for controlling the blower for supplying gas to at least one gas sack of a patient support, the method comprising:

(a) regulating the power supplied to operate the blower;

(b) at the expiration of a predetermined time interval, measuring the pressure of the gas exiting the blower;

(c) calculating an ideal blower reference pressure;

(d) determining the size of any discrepancy between the ideal blower reference pressure and the measured pressure; and

(e) when the discrepancy exceeds a predetermined magnitude, varying the power supplied to operate the blower so as to reduce the magnitude of the discrepancy.

5,182,827

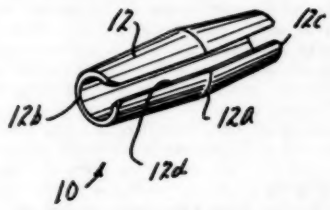
SHEET-MATTRESS RETAINER

Odie R. Carrier, 425 Eissler Rd., Evansville, Ind. 47711, and Steven C. Pike, 317 E. Mill Rd., Evansville, Ind. 47714

Filed Oct. 31, 1991, Ser. No. 785,536

Int. Cl.[5] A47C *21/02*

U.S. Cl. 5—498 **3 Claims**



1. An arrangement for retaining a sheet onto a mattress including binding tape along edges thereof comprising retainers each having a body including a mid-region, ends, a longitudinal opening therethrough and a longitudinal slot disposed along a wall of said opening, where said body tapers inwardly from said mid-region thereof towards each of said ends, and where said longitudinal opening receives said binding tape edge of said mattresses and said sheet and the configuration of said body serves to maintain said retainers in a fixed position.

5,182,828

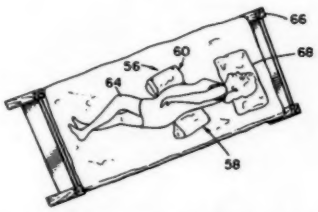
ROLL PREVENTING STRUCTURES

Margaret A. Alivizatos, Dallas, Tex., assignor to Maurice Adam, Dallas, Tex.

Filed Mar. 6, 1991, Ser. No. 665,341

Int. Cl.[5] A47G *9/00*

U.S. Cl. 5—631 **20 Claims**



1. A freestanding machine washable wedge shaped support structure for use as a roll-preventing, patient support, comprising:

an open mesh fabric base panel defined by spaced apart substantially parallel longitudinal edge portions and transverse edge portions between the ends of said longitudinal edge portions;

a pair of open mesh non-skid fabric support panels having longitudinal edge portions coextensive with the longitudinal edges of the base panel, said panels converging toward each other to meet at a longitudinal front edge spaced away from said longitudinal edge portions, each of said support panels having transverse edge portions extending between ends of one of said longitudinal edge portions and said front edge;

opposite triangular shaped open mesh fabric side panels, each side panel having a base edge coextensive with one transverse edge of the base panel and converging side edges coextensive with the transverse edge portions of the pair of support panels extending between said base panel and said front longitudinal edge portion to form an envelope; and

a multiplicity of discrete lightweight nonabsorbent plastic

floatable foam beads contained within the envelope by said open mesh fabric to form a wedge, substantially filling said envelope to a degree that allows free movement of said beads within the envelope so that the wedge can be molded to fit the contour of the patient's body, yet having the characteristic that when the envelope and plastic beads are compressed by a patient's weight, they interact to lock together in the previously molded shape to provide a firm support which restricts movement of the patient and allows circulation of air and moisture to help keep the patient dry

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5,182,829

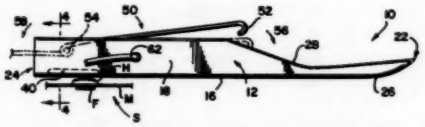
FASTENER HAND TOOL

Carroll Sears, P.O. Box 318, Wrightsville, N.C. 28480

Filed Sep. 4, 1991, Ser. No. 754,756

Int. Cl.[5] B25F *1/00*

U.S. Cl. 7—166 **22 Claims**



1. A hand tool for the connection and disconnection of a multipiece fastener, the tool comprising a lever body having at least one disconnecting end and at least one connecting end opposite said disconnecting end, said connecting end including a capture means for releasably receiving and releasably capturing a fastener piece while force is applied toward the disconnecting end said capture means defined as a recess comprising an open receiving portion, an open capturing portion, and a continuous open passageway placing each portion in fluid communication with one another; the open portion being adapted to releasably receive one mateable piece of a snap fastener, the passageway being configured to permit free movement of the received piece to or from the capturing portion, and the capturing portion having an undercut shaped and oriented in relation to the open portion to releasably capture and hold the fastener piece while force is applied for operably connecting the captured piece with a corresponding mateable piece.

5,182,830

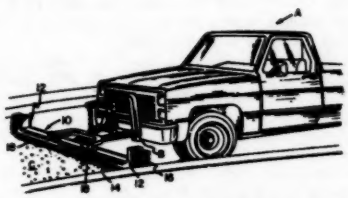
TRUCK MOUNTED PAVEMENT SWEEPING BRUSH

John Viola, 77A Brookwood Dr., Rocky Hill, Conn. 06067

Filed Nov. 26, 1991, Ser. No. 799,422

Int. Cl.[5] E01H *1/02*

U.S. Cl. 15—78 **6 Claims**



1. A brush assembly apparatus for cooperation with a snow plow mounting apparatus which comprises:

means for attachment to the associated snow plow mounting apparatus;

an elongated main body having at least a first generally L-shaped axial extremity;

a first plurality of bristles mounted in said main body and extending generally downwardly during normal operation and a second plurality of bristles mounted on said first axial extremity and extending outwardly in a generally axially aligned relationship to said main body; and

said elongated main body including means biasing said main body downwardly to insure thorough sweeping.

5,182,831

WINDSCREEN WIPER BLADE ARRANGEMENT WITH ORIENTATION INDICATING MEANS

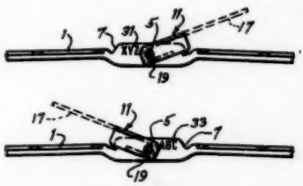
Stephen D. Knight, Hillingdon, United Kingdom, assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Jan. 13, 1992, Ser. No. 819,745

Claims priority, application United Kingdom, Jan. 17, 1991, 9101039

Int. Cl.[5] B60S *1/04, 1/40*

U.S. Cl. 15—250.42 **2 Claims**



1. In a windscreen wiper blade arrangement,

an elongated windscreen wiper blade having front an back sides an including at least a main yoke having a pair of opposed walls extending lengthwise of said main yoke, said walls including interior surfaces defining an aperture between said walls,

sail wiper blade having a vane structure along said front side adapted to face forward of a vehicle to which said wiper blade is fitted,

a pivot pin extending between said walls across said aperture,

a connector body positioned at said walls and cooperating with said pivot pin to provide a pivotable connection between a drive arm and said wiper blade, said connector body being attachable to said pivot pin in either of two orientations whereby said connector body extends away from said aperture in either of two opposite directions along said wiper blade,

indicia on at least one of said walls and located on opposite sides of said pivot pin,

said connector body being constructed and arranged to obscure only a first part of said indicia to one side of said pivot pin when in a first orientation on said pivot pin and to obscure only a second part of said indicia when mounted in a second orientation on said pivot pin.

5,182,832

AIR FILTER CLEANING APPARATUS

Michael R. McMahon, 3819 Smoketree Way - 232, Phelan, Calif. 92371

Filed Apr. 27, 1992, Ser. No. 874,408

Int. Cl.[5] A47L *5/14*

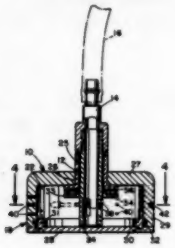
U.S. Cl. 15—304 **8 Claims**

1. Air filter cleaning apparatus, comprising:

an inlet tube having connector means at one end for connection to an air hose;

an enlarged head rotatably mounted at the opposite end of the inlet tube, the head having an outer peripheral wall enclosing an internal air distribution chamber, the chamber being connected to said inlet tube, and the outer peripheral wall having a plurality of outlets spaced around

its periphery for directing air out of the chamber towards an air filter unit; and



said head including rotor means for re-directing air in a direction to cause rotation of said head relative to said inlet tube.

5,182,833

VACUUM CLEANER

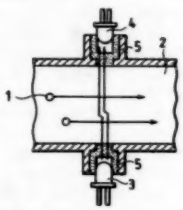
Seiji Yamaguchi, Shiga; Masaru Moro; Saburou Kajikawa, both of Youkaichi; Masahiro Kimura, Shiga; Hideo Okubo, Youkaichi; Tadashi Matsuyo, Youkaichi, and Hiroshi Kawakami, Youkaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1990, Ser. No. 518,402

Claims priority, application Japan, May 11, 1989, 1-118260; May 23, 1989, 1-130409; May 23, 1989, 1-130412; Aug. 18, 1989, 1-213376

Int. Cl.[5] A47L *9/28*

U.S. Cl. 15—319 **21 Claims**



1. A vacuum cleaner comprising:

(a) a blower motor;

(b) dust detection means having a light emitting portion for emitting a light and a light sensitive portion for receiving the light from said light emitting portion, said light sensitive portion and light emitting portion being arranged to effect a light path therebetween across a portion of a suction passage, said dust detection means detecting interceptions of said light path by at least one dust particle crossing said light path to produce a dust detection signal;

(c) dust amount detection means responsive to said dust detection signal from said dust detection means for detecting a relative dust amount by counting the number of said interceptions for a given interval; and

(d) input power controlling means responsive to an output signal of said dust amount detection means for controlling input power provided to said blower motor in accordance with said number.

5,182,834

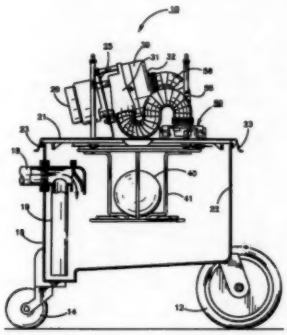
VACUUM PUMP-OUT CONTROL VALVE FOR WET/DRY VACUUM CLEANER

William R. Wright, and Dexter Lehman, both of Elkhart, Ind., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Apr. 16, 1992, Ser. No. 869,387

Int. Cl.[5] A47L *5/14, 7/00*

U.S. Cl. 15—330 **6 Claims**



1. In a wet/dry vacuum system including a collection tank, a cover closing the top of the tank and a blower having an air inlet and an air outlet:

a flow control valve which comprises:

means defining a pair of openings through said cover on opposite sides of a central axis perpendicular to said cover;

a manifold plate located over said pair of openings and spaced from said cover, said plate having an air inlet fitting communicating with said blower motor air inlet and an air outlet fitting, communicating with said blower air outlet, said inlet and outlet fittings being in alignment with said openings in said cover;

a valve rotor located between said manifold plate and said cover and adapted for rotation about said axis between a pressure position and a vacuum position;

passage means formed in said rotor for connecting said manifold plate inlet and one of said openings in said cover and closing the other of said openings when said rotor is in its vacuum position to cause a vacuum in said tank and for connecting said manifold plate outlet with the other opening in said cover and closing said one of said openings when said rotor is in its pressure position to cause a pressurizing of said tank.

5,182,835

METHOD AND PLANT FOR MAKING LAPS FOR FELTS

Angelo de' Giudici, Mestre-Venezia, Italy, assignor to Feltrifico Veneto S.p.A., Mestre-Venezia, Italy

Filed Mar. 26, 1991, Ser. No. 675,159

Claims priority, application Italy, Jul. 18, 1990, 12488 A/90

Int. Cl.[5] D01G *25/00*

U.S. Cl. 19—296 **22 Claims**

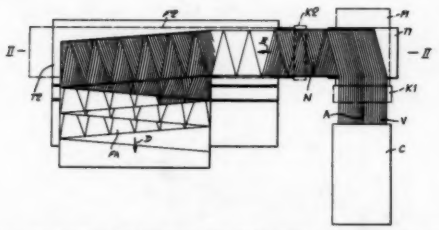
1. A method for making final laps for needled felts comprising the steps of:

delivering a card web from a card with lap fibers substantially parallel to a delivery direction;

intermediately folding the card web intermittently in the delivery direction onto an intermediate ribbon lap-carrying conveyor which extends and is caused to intermittently run transversely to the delivery direction such that an intermediate ribbon lap is provided on the conveyor having a longitudinal extent and the lap fibers substantially arranged parallel to the delivery direction;

cutting of the card web into ribbon lengths so that on the

intermediate ribbon lap-carrying conveyor the intermediate ribbon lap is discontinuous and formed successively from at least one layer of the ribbon lengths arranged longitudinally and endwise; and



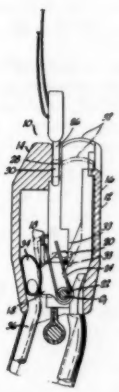
finally folding the intermediate ribbon lap in the direction of the longitudinal extent to form a final lap having a width dimension greater than that of the card web and the lap fibers substantially arranged in a longitudinal direction of the final lap.

5,182,836

PRESSURE ACTIVATED SEAT BELT LOCKING MECHANISM

Alexander Burkat, Placentia, Calif., assignor to The Walt Disney Company, Burbank, Calif.

Filed Aug. 30, 1991, Ser. No. 753,410
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—633 **6 Claims**



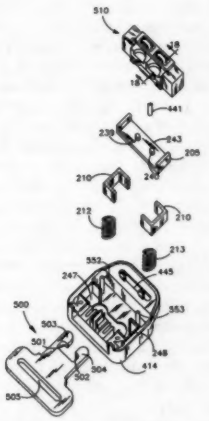
1. A seat belt locking mechanism comprising:
a seat belt buckle;
a latching tongue capable of being inserted into the buckle;
a retractable element which extends through an aperture in the latching tongue when the latching tongue is fully inserted into the buckle;
a release latch which can be depressed to disengage the retractable element from the aperture in order to release the latching tongue from the buckle;
a lever lock contained within the buckle and which is pivotable about a shaft;
a spring which bears against the lever lock to normally urge it in a downward position;
an air bladder positioned underneath the lever lock, said air bladder connected to a pressure source such that it can be inflated upon pressurization from the pressure source; and
whereby upon inflation, the air bladder urges the lever lock upwardly, overcoming the downward force of the spring, such that the lever lock either bears against or is positioned a slight distance from the release latch thereby preventing it from being depressed in order to disengage the retractable element from the aperture so that the latching tongue could be removed from the buckle to unlock the seat belt.

5,182,837

BELT BUCKLE WITH EJECTOR MODULE AND TONGUE STOP

James R. Anthony, Carmel, and Michael A. Wiseman, Indianapolis, both of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Continuation-in-part of Ser. No. 714,710, Jun. 13, 1991, Pat. No. 5,142,748, which is a continuation-in-part of Ser. No. 536,170, Jun. 11, 1990, Pat. No. 5,038,446, and a continuation-in-part of Ser. No. 370,240, Jun. 22, 1989, Pat. No. 5,023,981. This application Jun. 10, 1992, Ser. No. 896,208
Int. Cl.[5] A44B *11/00*
U.S. Cl. 24—642 **15 Claims**



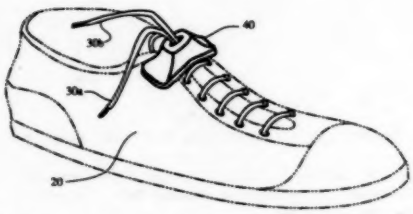
1. A belt buckle-tongue combination comprising:
a buckle main body;
tongue means insertable along a plane into said buckle main body with said tongue means releasable lockable with said buckle main body;
a latch positioned in said main body and held captive therein, said latch movable between a latched position with said tongue means and an unlatched position;
first means operably associated with said latch to move said latch back and forth between said latched position and said unlatched position; and,
an ejector module assembly mounted in said buckle to eject said tongue means when not latched with said latch, said assembly including a ejector housing, at least one ejector member slidably mounted in said housing and engagable with said tongue means and spring means mounted in said ejector housing normally urging said ejector member outwardly to engage said tongue means but yieldable to allow withdrawal of said ejector member under force from said tongue means, said ejector housing with said ejector member and spring means forming said assembly and inserted into said buckle main body as a unit.

5,182,838

FILAMENT, CORDAGE LOCKING DEVICE

John R. Stenner, 375 Bates Ave., Boulder, Colo. 80303

Filed Aug. 13, 1991, Ser. No. 744,445
Int. Cl.[5] A43C *7/00*
U.S. Cl. 24—712.7 **20 Claims**



1. A cord lock device for securely engaging a cord, said device comprising:

(a) an elastic, resilient body having an exterior and a substantially solid interior, said body also having a pair of generally opposite top and bottom exterior surface portions, a pair of generally opposite front and rear side exterior surface portions, and a pair of generally opposite right and left end exterior surface portions;

(b) said body further having a slit extending through said substantially solid interior of said body between said opposite top and bottom exterior surface portions thereof to form a passageway for receiving a cord through said body, said slit being defined by a pair of opposing interior right and left end walls spaced inwardly from said opposite right and left end exterior surface portions of said body and a pair of opposing interior front and rear side walls spaced inwardly from said opposite front and rear side exterior surface portions of said body;

(c) said opposing interior front and rear side walls and said opposing interior right and left end walls extending between said opposite top and bottom exterior surface portions of said body and said opposing interior right and left end walls extending between and interconnecting respective opposite ends of said opposing interior front and rear side walls such that said substantially solid interior of said body completely surrounds said passageway defined by said slit with the cord received therethrough extending from said opposite top and bottom exterior surface portions of said body;

(d) said opposing interior front and rear side walls of said slit including gripping surfaces thereon being capable of engaging and gripping and thereby securely holding the cord extending through said passageway;

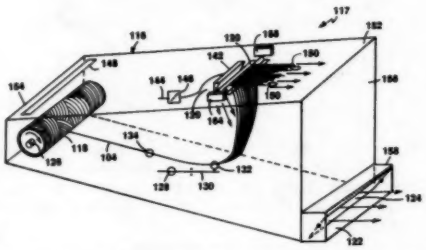
(e) said opposing interior front and rear side walls of said slit having respective widths extending between said opposing interior right and left end walls of said slit that are substantially longer than respective widths of said opposing interior right and left end walls of said slit extending between said opposing interior front and rear side walls of said slit such that application of inwardly directed pressure at said opposite right and left end exterior surface portions of said body will cause said opposing interior right and left end walls of said slit to move toward one another and said opposing interior front and rear side walls of said slit to move away from one another to thereby cause said slit to deform from a substantially closed unpuckered configuration in which said gripping surfaces of said opposing interior front and rear side walls securely hold the cord, to a substantially opened puckered configuration in which the cord, being held securely by said gripping surfaces, is released for permitting moving of said body relative to the cord.

5,182,839

APPARATUS AND METHOD FOR COMMINGLING CONTINUOUS MULTIFILAMENT YARNS

Lambert M. Stuart, North Kingstown, R.I., assignor to Concordia Mfg. Co., Inc., Coventry, R.I.

Continuation-in-part of Ser. No. 377,175, Jul. 10, 1989, Pat. No. 5,060,807, which is a continuation of Ser. No. 21,248, Mar. 3, 1987. This application Mar. 15, 1991, Ser. No. 670,288
Int. Cl.[5] D01D *11/02*; B23Q *15/00*
U.S. Cl. 28—283 **34 Claims**



1. Apparatus for spreading filaments of a multiple filament yarn comprising

an enclosure having a yarn exit opening for passage of a multiple filament yarn with filaments that are spaced from each other, said enclosure also having an air removal opening,

a source of said multiple filament yarn completely contained within said enclosure, said multiple filament yarn extending from said source to and through said yarn exit opening, said yarn having a portion between said source and said yarn exit opening that is transverse to the direction of travel of air from said yarn exit opening to said air removal opening, and

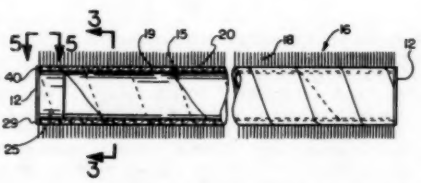
means for providing a lower pressure at said air removal opening than at said yarn exit opening so as to cause air flow from said yarn exit opening through and around said portion of said yarn to said air removal opening.

5,182,840

EPOXY FLOOR ROLLER TOOL AND METHOD OF MAKING SAME

William A. Jacobs, Wooster, and William P. Camp, Jr., Millersburg, both of Ohio, assignors to The Wooster Brush Company, Wooster, Ohio

Filed Dec. 19, 1991, Ser. No. 810,105
Int. Cl.[5] B30B *3/00*
U.S. Cl. 492—24 **11 Claims**



1. An epoxy floor roller tool comprising a roller core tube, a continuous strip of carding cloth spirally wound around said tune with each succeeding winding of said carding cloth in butting engagement with a preceding winding, and end caps closing the ends of said tube, said carding cloth covering the entire length of said tube, said carding cloth having a fabric backing member, and rigid, densely packed, thin metal wires extending radially outwardly from said backing member over

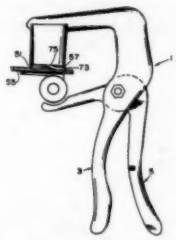
the entire length of said tube for use in breaking air bubbles in epoxy and polyurethane floor materials after the floor materials have been spread over a floor and before the floor materials have hardened, said wires comprising leg members of generally U-shape wire members extending through said backing member, said wire members having cross members pressed up against a back side of said backing member, said backing member and said cross members being adhesively bonded to said tube.

5,182,841

HYDRAULIC WHEEL CYLINDER TOOL

James M. Park, 1399 W. Berry Dr., Littleton, Colo. 80120, and Ralph L. Stichter, 11741 Jackson St., Thornton, Colo. 80233

Filed Jan. 7, 1992, Ser. No. 817,632
Int. Cl.[5] B25B *27/02*
U.S. Cl. 29—229 **20 Claims**



1. A hydraulic wheel cylinder retainer clip applying tool comprising a hinge, a first lever connected to the hinge, and a second lever connected to the hinge, the first and second levers having respectively first and second handle portions and first and second jaw portions, the hinge being positioned in the levers between the respective jaw and handle portions, whereby moving the handle portions toward each other moves the jaw portions toward each other, the first and second jaw portions extending generally perpendicular to the first and second handle portions, the first and second jaw portions having proximal ends near the hinge and having distal ends remote from the hinge, a cylinder having one axial end connected to the distal end of the first jaw portion, the cylinder having an axis perpendicular to the hinge and generally parallel to the first handle portion, a concave depression in the distal end of the second jaw portion, the concave depression being formed about an axis generally perpendicular to the cylinder axis and generally parallel to the hinge.

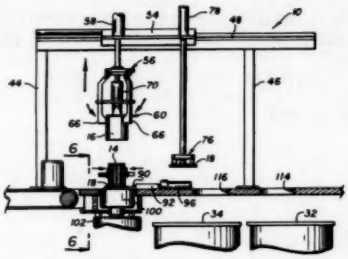
5,182,842

OIL FILTER DISASSEMBLY AND RECYCLING APPARATUS

Gilbert B. Ross, 17640 Vincennes, Northridge, Calif. 91325, and Charles Brittain, 10177 Elkwood, Sun Valley, Calif. 91352

Filed Mar. 13, 1992, Ser. No. 851,011
Int. Cl.[5] B23P *19/04*; B67B *7/46*; B23B *5/14*
U.S. Cl. 29—240 **45 Claims**

1. Disassembly and recycling apparatus for oil filters comprising a vertically extended filter element, a downwardly open canister comprising a wall enclosing said filter element, and a perforated metal base fixed across the canister opening in filter element securing relation, said apparatus comprising at a severing locus a filter retaining means including pin means extendible through said metal base perforations, cutting means disposed radially of said pin means and arranged to cut said metal base free from said canister, and individual means for shifting said base, said canister and said filter element to respective receptacles for recycling said metal base, said canister and said filter element.

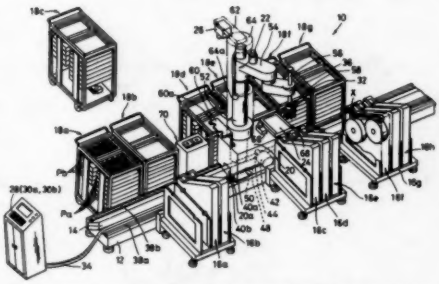


5,182,843

METHOD FOR ASSEMBLING OBJECTS BY REVERSING UP AND DOWN AN ATTITUDE OF THE ASSEMBLY

Sachio Umetsu, and Toshihiko Miura, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 524,083, May 16, 1990, abandoned. This application Feb. 27, 1992, Ser. No. 841,202
Claims priority, application Japan, May 16, 1989, 1-120422; Mar. 26, 1990, 2-073506; Apr. 13, 1990, 2-098916
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—445 **2 Claims**



1. An assembly-attitude reversing method for assembling a plurality of objects and for reversing up and down an attitude of the assembly comprising the steps of:

positioning a first mounting member having a first mounting surface and a second mounting member having a second mounting surface in a waiting state;

setting a first object and a second object on said first and second mounting surfaces of said first and second mounting members in said waiting state respectively, said first and second mounting surfaces respectively hold said first and second objects;

superposing said first mounting surface having said first object set thereon on said second mounting surface having said second object set thereon while maintaining said first object set to said first mounting surface in a holding state thereby obtaining an assembly by combining said first object and said second object;

reversing said superposed first and second mounting members in synchronized rotation thereby positioning said second object set in said second mounting surface over said first object set in said first mounting surface;

opening said second mounting member while maintaining said assembly of said first and second objects on said first mounting member in the holding state; and

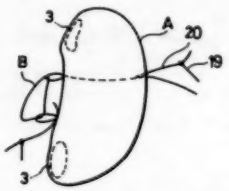
picking up said assembly from said first mounting member.

5,182,844

METHOD OF PRODUCING A STUFFED DOLL

Akito Honda, 21-15; Okusawa 5-chome, Setagaya-Ku, Tokyo, Japan

Filed Mar. 30, 1992, Ser. No. 860,024
Int. Cl.[5] A63H *3/02, 3/36*
U.S. Cl. 29—469 **6 Claims**



1. A method of producing a stuffed doll comprising the steps of:

forming elastic cloth such as rib stitch cloth, interlock stitch cloth or the like into a bag-like member;

inserting shaping members formed in shapes of a forehead and a chin into said bag-like member to its inside upper and lower portions respectively;

filling said bag-like member with stuffing to thereby form a head base having a predetermined shape;

fixing long-haired hair members, eyebrow members, eye members, a nose member, and a mouth member on said head base to thereby form a head portion; and

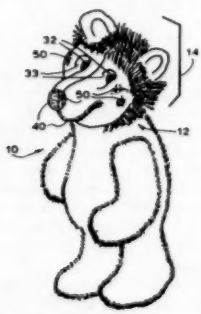
fixing said head portion on a body portion.

5,182,845

METHOD OF MAKING STUFFED FIGURE WITH SCULPTURED SOFT FACE

David W. Dean, Bath, N.H., assignor to DCN Industries, Inc., Boynton Beach, Fla.

Filed Sep. 26, 1991, Ser. No. 766,003
Int. Cl.[5] A63H *3/02;* **B23P** *21/00*
U.S. Cl. 29—469 **14 Claims**



1. A method of manufacturing a three dimensional stuffed figure with a face combining the sculptured appearance of a hard face and the softness of a plush face, comprising the steps of:

(A) providing an inverted plush body and a plush blank configured and dimensioned to form a head and define a facial aperture;

the facial aperture of the blank a face having a front surface of stretch material and a rear surface of non-stretch material defining a stuffing aperture;

(C) stuffing a quantity of stuffing forwardly into the secured face through the stuffing aperture in the non-stretch material sufficient to stretch the stretch material relative to the non-stretch material;

(D) contouring facial details of the front surface of the stuffed face by tensioning threads extending from the non-stretch material through the stretch material and back to the non-stretch material;

(E) inverting the contoured head, securing the inverted head to the inverted body to define an inversion aperture, and re-inverting the inverted head and body through the inversion aperture; and

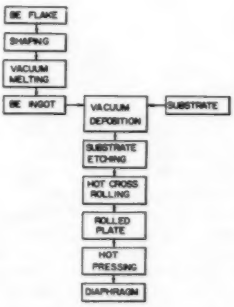
(F) stuffing the re-inverted head and body with stuffing through the inversion aperture and then operatively closing the inversion aperture.

5,182,846

PROCESS FOR PRODUCING A DIAPHRAGM FOR ACOUSTIC APPLIANCES

Nobuaki Tomita, and Kunio Suzuki, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Oct. 2, 1991, Ser. No. 770,224
Claims priority, application Japan, Oct. 4, 1990, 2-267341
Int. Cl.[5] B23P *17/00*
U.S. Cl. 29—527.2 **11 Claims**



1. Process for producing a diaphragm for acoustic appliances comprising the steps of

forming a beryllium layer on a substrate by means of vacuum deposition,

separating said beryllium layer from said substrate to obtain a crude beryllium plate,

subjecting said beryllium plate to hot cross rolling to obtain a rolled beryllium plate, and

subjecting said rolled beryllium plate to hot pressing.

5,182,847

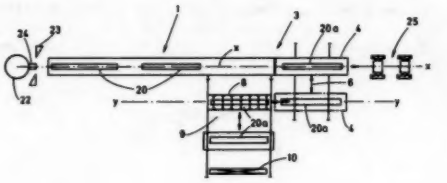
METHOD AND APPARATUS FOR MANUFACTURING HOT-ROLLED STRIPS OR SECTIONS FROM CONTINUOUSLY CAST PRIMARY MATERIAL

Rudolf Guse, Ratingen; Dieter Nobis, Neuss, and Hans Mailnowski, Düsseldorf, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 5, 1991, Ser. No. 710,662
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1990, 4017928
Int. Cl.[5] B21B *1/46*
U.S. Cl. 29—527.7 **17 Claims**

1. In a method for manufacturing hot-rolled strips or sections form continuously cast primary material in successive work steps in a production line of a closed process chain, the method including dividing an endless primary material obtained by an uninterrupted casting process after solidification into individual slab pieces of predetermined length, heating the

slab pieces in an equalizing furnace to rolling temperature and subsequently rolling the slab pieces into predetermined final dimensions, wherein, for bridging a comparatively short interruption of the rolling process, a slab piece obtained from the uninterrupted casting process is moved into a buffer zone of the equalizing furnace, the improvement comprising, for bridging a relatively long interruption of the rolling process, dividing primary material obtained during the uninterrupted casting process in slab pieces having a predetermined length, moving the slab pieces out of the process chain by means of a furnace part in the form of a transverse conveyor, conveying the slab pieces into a side line laterally and parallel offset next to the production line, storing the slab pieces as necessary in a holding furnace, heating the slab pieces in the holding furnace to rolling temperature of maintaining the slab pieces in the holding furnace at rolling temperature, and stacking the slab pieces in the holding furnace, and, after the interruption has been



eliminated, returning the slab pieces in reverse direction into the process chain.

7. In an arrangement for manufacturing hot-rolled strips or sections from continuously cast primary material in successive work steps of a closed process and arrangement chain, the arrangement including a compact strip production continuous casting plant, an equalizing furnace and a rolling mill, the continuous casting plant, the equalizing furnace and the rolling mill being arranged in a production line, the improvement comprising the equalizing furnace having a first furnace part at an exit side of the equalizing furnace, the first furnace part comprising means for transversely conveying the first furnace part between the production line and a side line, and wherein the first furnace part comprises means for heating slab pieces received by the first furnace part, wherein the heating means are configured to be effective when the first furnace part is in the production line and when the first furnace part is in the side line.

5,182,848

METHOD FOR ASSEMBLING A STATOR SUBASSEMBLY

Dale K. Wheeler, Fallston, Md., assignor to Black & Decker Inc., Newark, Del.

Division of Ser. No. 443,671, Nov. 28, 1989, Pat. No. 5,099,164, which is a division of Ser. No. 77,263, Jul. 24, 1987, Pat. No. 4,885,496. This application Nov. 19, 1991, Ser. No. 794,557
Int. Cl.[5] H02K *15/06*
U.S. Cl. 29—596 **9 Claims**

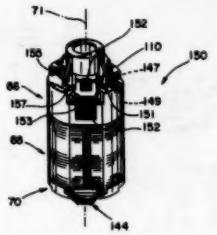
1. A method of assembling a stator subassembly, which comprises the steps of:

(a) forming a stator end member having a first end and a second end and having a bridging section across the first end thereof;

(b) assembling a bearing with the bridging section;

(c) subsequent to steps (a) and (b), assembling the stator end member and a stator field core with the second end of the stator end member in an interfacing position with an end of the stator field core, and

(d) subsequent to step (c), winding a wire about at least portions of the stator end member and the stator field core



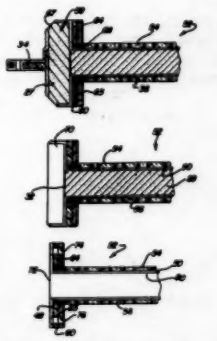
to form a coil winding and to hold the stator end member and the field core in the interfacing position.

5,182,849

PROCESS OF MANUFACTURING LIGHTWEIGHT, LOW COST MICROWAVE COMPONENTS

Alex A. Marco, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 21, 1990, Ser. No. 631,826
Int. Cl.[5] H01P *11/00*
U.S. Cl. 29—600 **25 Claims**



1. A process of fabricating a microwave component comprising the steps of:

forming a dissolvable mandril from salt into a desired shape;

forming a conductive layer on the outer surfaces of the mandril;

dissolving the mandril in an aqueous solution; and

applying an anodized coating to the conductive layer.

5,182,850

PARTS ASSEMBLING DEVICE

Isao Kondo, and Yosio Taki, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

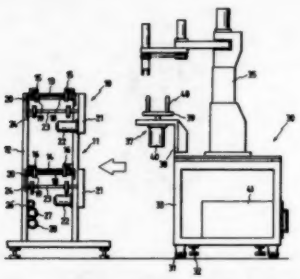
Filed Dec. 12, 1991, Ser. No. 805,961
Claims priority, application Japan, Jan. 25, 1991, 3-25681
Int. Cl.[5] B23D *49/00*
U.S. Cl. 29—784 **5 Claims**

1. An assembling device for parts comprising:

at least one parts carrying unit comprising pallet carrying belts and means for supplying electrical power to a parts assembling unit, said parts carrying unit having one side formed to be connected to said parts assembling unit; and

a parts assembling unit, said parts assembling unit being movably formed so as to be connectable to said one side of said parts carrying unit, said parts assembling unit comprising pallet positioning means capable of being placed at

an immediately lower portion of said pallet carrying belts while said parts assembling unit is connected to said parts



carrying unit, and assembling means for assembling parts on a workpiece mounted on a pallet carried on said pallet carrying belts.

5,182,851

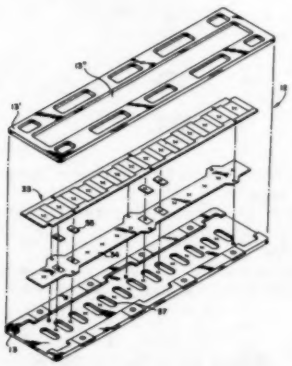
METHOD FOR HOLDING A STRIP OF CONDUCTIVE LEAD FRAMES

Robert H. Bond; Michael A. Olla, both of Denton; Barry Morrison, Bedford, and Linn C. Garrison, Dallas, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Division of Ser. No. 265,231, Oct. 31, 1988, Pat. No. 5,111,935, which is a division of Ser. No. 170,069, Mar. 14, 1988, Pat. No. 4,815,595, which is a continuation of Ser. No. 937,558, Dec. 3, 1986, abandoned. This application Nov. 22, 1991, Ser. No. 796,419

Int. Cl.[5] H01R *43/00*

U.S. Cl. 29—827 **9 Claims**



1. A method for holding a strip of conductive leadframes together with a plurality of semiconductor chips which comprises:

a) providing a leadframe carrier of the type having a pair of planar, substantially rectangular upper and lower mating members which are attachable to one another along their outer perimeters, at least one of said upper and lower members being intersected by a longitudinal groove and a plurality of keyways;

b) providing a leadframe carrier insert sheet having a shape which corresponds to the groove and keyways of said members, said insert sheet having a plurality of recesses in a surface thereof which are adapted to retain a semiconductor chip therein;

c) disposing the insert sheet in said groove and keyways;

d) disposing a semiconductor chip having contact pads in each of said recesses;

e) providing a flat strip leadframe ribbon including a plurality of leadframes having electrically shorted contact leads, and disposing the leadframe ribbon on said chips and said insert such that the leadframe contact leads meet the corresponding contact pads of the semiconductor chips; and,

f) attaching the upper and lower carrier members together with the insert, chips and leadframes therebetween.

5,182,852

REVERSIBLE PRODUCTION PROCESS FOR ASSEMBLY OF CIRCUIT BOARD AND SUBSTRATE

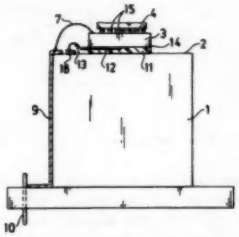
Jean-Louis Montanari, Herbeys, France, assignor to Societe Francaise de Detecteurs Infrarouges (SOFRADIR), France

Filed Nov. 8, 1991, Ser. No. 789,359

Claims priority, application France, Nov. 9, 1990, 90 14182

Int. Cl.[5] H05K *3/34*

U.S. Cl. 29—840 **6 Claims**



1. A method of attaching a circuit board to a substrate wherein the front face of the circuit board has conductive tracks thereon and the back face of said circuit board is metalized, the method including the steps of

placing a silicone adhesive layer between the back face of the circuit board and a substrate,

interposing a conductive foil between the back face of the circuit board and the adhesive layer, and

connecting the foil to a terminal mounted upon the substrate.

5,182,853

METHOD FOR ENCAPSULTING IC CHIP

Yasushi Kobayashi, Kamikodanaka, and Seiji Kogure, Nakahara, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 31, 1991, Ser. No. 786,088

Claims priority, application Japan, Nov. 6, 1990, 2-300148

Int. Cl.[5] H05K *3/30*

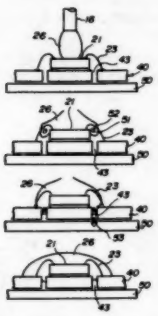
U.S. Cl. 29—841 **11 Claims**

1. A resin encapsulating method for encapsulating an integrated circuit chip which is mounted on a substrate using a resin, said resin encapsulating method comprising the steps of:

(a) forming a substrate structure which is made up of a substrate, first pads formed on the substrate, an integrated circuit chip mounted on the substrate, second pads formed on the integrated circuit chip, and interconnections formed across the first and second pads, said substrate having one or a plurality of holes which penetrate the substrate and are located below the interconnections;

(b) supplying a predetermined quantity of a resin on the substrate structure so that the resin covers the integrated circuit chip and the interconnections and the resin flows between the interconnections to reach the holes below the interconnections; and

(c) drawing the resin under vacuum suction via the holes, so as to provide an escape path for air cells which are generated within the resin as the resin flows between the interconnections in said step (b).



5,182,854

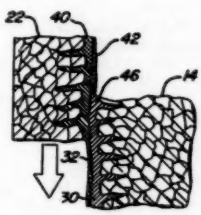
METHOD FOR METALLURGICALLY BONDING PRESSED-IN CYLINDER LINERS TO A CYLINDER BLOCK

Karl D. Voss, Farmington Hills, Mich., assignor to CMI International, Inc., Southfield, Mich.

Filed Jan. 15, 1992, Ser. No. 822,537

Int. Cl.[5] F02F *1/00*

U.S. Cl. 29—888.061 **13 Claims**



1. A method for metallurgically bonding a cylinder liner to a cylinder block of an internal combustion engine, said method comprising the steps of;

casting a metal cylinder block **(14)** having at least one cylindrical wall defining a piston cylinder **(16)** of fixed inner diameter D_1;

forming a cylindrical-shaped tubular liner **22** from high wear-resistant metal material having an outer surface diameter D_2 slightly larger than the inner diameter D_1 of the piston cylinder **(16)**;

applying low melting point molten coating material **(24)** to one of the outer surface of the liner **(22)** and the cylinder wall **(16)**;

heating the cylinder block **(14)** and the liner **(22)** to an elevated temperature;

and then forcing the liner **(22)** into the piston cylinder **(16)** with an interference fit causing the coating material **(24)** to alloy with the liner and cylinder block metals forming a metallurgically bonded region **(46)** between the liner **(22)** and cylinder wall **(16)**, joining the same together.

5,182,855

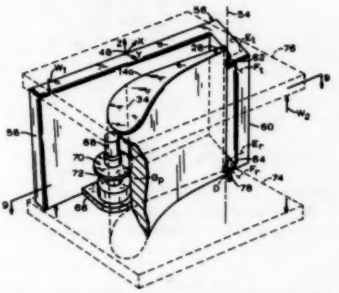
TURBINE NOZZLE MANUFACTURING METHOD

Jack R. Martin, Bedford, Mass., assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 13, 1990, Ser. No. 627,161

Int. Cl.[5] B23P *15/02*

U.S. Cl. 29—889.22 **15 Claims**



1. A method of manufacturing a turbine nozzle having a plurality of circumferentially spaced vanes fixedly joined to radially outer and inner bands, each vane including a root fixedly joined to said inner band, a tip fixedly joined to said outer band, a leading edge, a trailing edge, suction and pressure sides extending from said leading edge to said trailing edge and between said root and said tip, and a throat line extending from said root to said tip on said suction side for defining a throat area with a trailing edge of an adjacent one of said vanes, said method comprising:

providing a first one of said vanes;

providing a datum for locating said first vane relative to said adjacent vane; and

fixturing said first vane relative to said datum for providing a trailing edge nest having six supports for predeterminedly locating said first vane relative to said adjacent vane, said trailing edge next including four trailing edge supports for locating said first vane trailing edge to define a hinge axis extending along said trailing edge about which said first vane is rotatable, a radial support for radially locating said first vane, and a throat support for predeterminedly locating said first vane about said hinge axis for obtaining a predetermined value of said throat area.

5,182,856

HEAT EXCHANGER

Horst Armbruster, Illingen, Fed. Rep. of Germany, assignor to Behr GmbH & Co., Fed. Rep. of Germany

Filed Dec. 18, 1991, Ser. No. 809,142

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1990, 4042019

Int. Cl.[5] B23P *15/26*; F01P *11/08*; F28F *3/08*

U.S. Cl. 29—890.039 **5 Claims**

1. A method of manufacturing a heat exchanger of the type including a stack of disk bodies stacked on top of one another and connected with one another by flow through openings and a housing enclosing the stack of disk bodies, the housing and disk bodies defining flow openings for respective heat exchange fluids, said method comprising:

forming a plastic housing bottom part,

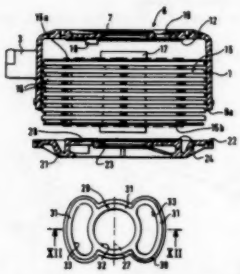
forming a plastic housing lid part,

forming a fitted sealing device,

forming a stack of disk bodies,

placing the fitted sealing device between an end of the stack

of disk bodies and one of the housing bottom part and housing lid part,



and welding the housing bottom part to the housing lid part with the stack of disk bodies and sealing device enclosed therebetween and compressing the sealing device.

5,182,857

SHAVING APPARATUS

Pal Simon, Warstein, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

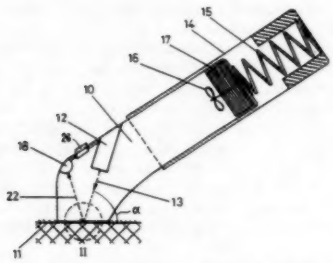
PCT No. PCT/EP90/01929, § 371 Date Sep. 3, 1991, § 102(e) Date Sep. 3, 1991, PCT Pub. No. WO91/06406, PCT Pub. Date May 16, 1991

PCT Filed Oct. 29, 1990, Ser. No. 679,077

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936367

Int. Cl.[5] A61B *17/00*

U.S. Cl. 30—34.05 **10 Claims**



1. A shaving apparatus comprising a housing (10) and a shear plate (11) with a hair entry slot (24) wherein inside the housing (10) there is provided a device (12) for generating a laser beam (13) which acts as a cutting means and which impinges on the inner side of the shear plate (11) in the proximity of the entry slot (24) where it acts upon and severs the hair, said laser beam (13) impinging on said shear plate (11) and being reflected along the entry slot (24) in a reflecting zone of incidence (23) on the shear plate (11).

5,182,858

RAZOR MECHANISM

Evan N. Chen, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 361,454, Jun. 5, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 600,290

The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.

Int. Cl.[5] B26B *21/14*

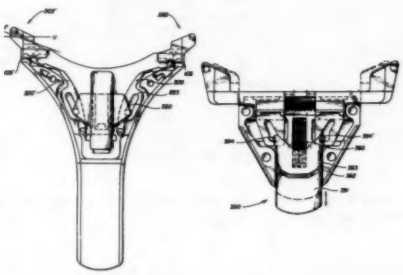
U.S. Cl. 30—85 **19 Claims**

1. A razor mechanism for use with a flexible cartridge comprising:

a housing having a substantially enclosed interior portion, a distal end, a proximal end and a central longitudinal axis extending from said distal end to said proximal end;

an actuator slidably connected to said housing for movement in a direction substantially parallel to said longitudinal axis, said actuator comprising at least one prong member;

an attachment member having a pivoting end and an attachment end, wherein said pivoting end is pivotally connected to said housing within said interior portion, and at least a portion of said attachment member is disposed



within said interior portion, said attachment end is moveable in response to flexing of said flexible cartridge during shaving;

said attachment member further comprising at least one flexure point disposed between said attachment end and said pivoting end; and

wherein said actuator engages said attachment member such that said attachment end moves in a direction substantially perpendicular to said longitudinal axis in response to the movement of said actuator.

5,182,859

CABLE STRIPPER

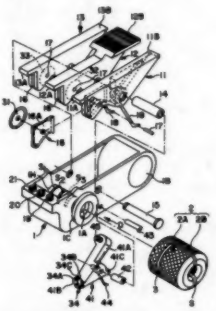
Naoki Yoshimori, Tokyo, Japan, assignor to Canare Electric Co., Ltd., Aichi, Japan

Filed Dec. 9, 1991, Ser. No. 804,794

Claims priority, application Japan, Aug. 8, 1991, 3-199223

Int. Cl.[5] B21F *13/00*

U.S. Cl. 30—90.6 **3 Claims**



1. A cable stripper comprising:

a main stripper body;

a cable holder rotatably mounted on said main stripper body and capable of guiding an end portion of a cable thereinto, said main stripper body being free to rotate about the axis of said cable;

operating levers pivotally installed in said main stripper body such that all of said operating levers pivot together when one of said operating levers is depressed, said oper-

ating levers being installed on said main stripper body adjacent each other along said axis of said cable and including first circular blades for cutting said cable circumferentially which are mounted to said tip portions of said operating levers with edges of said first circular blades being oriented perpendicular to the axis of said cable which is inserted in a cable guide formed in said stripper body so that said edges are moved by a prescribed amount into said cable guide when said operating levers are pivoted in one direction;

a second blade for cutting said cable longitudinally which is installed in said main stripper body so as to move toward the interior of said cable guide, an edge of said second blade being oriented parallel with the axis of said cable inside said cable guide; and

a second blade moving assembly which moves the edge of said second blade a prescribed amount into said cable guide when said operating levers are rotated in said one direction.

5,182,860

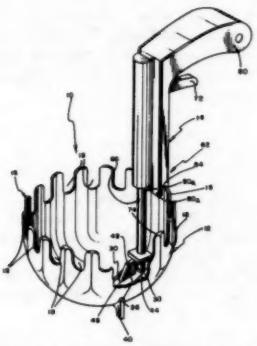
SKIMMER

Delmar A. Kuhlman, P.O. Box 3158, Wichita, Kans. 67201-3158

Filed Sep. 3, 1991, Ser. No. 754,060

Int. Cl.[5] A47J *43/28*

U.S. Cl. 30—325 **20 Claims**



18. A skimmer for removing fat from a liquid comprising a bowl having a bottom, said bowl having a structure defining an opening in the bottom of the bowl; a handle member releasably engaging said bowl an decomposing a hollow handle neck having a structure defining a handle bore; a plunger slidably disposed in said handle bore such as to normally cover said opening; and a means, engaged to said plunger, for elevating the plunger such as to uncover said opening.

5,182,861

SHEET-DRIVEN TYPE AUTOMATIC DRAFTING MACHINE

Masaaki Suzuki, and Tooru Eshita, both of Tokyo, Japan, assignors to Mutoh Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 545,896, Jun. 29, 1990, abandoned. This application Mar. 19, 1992, Ser. No. 853,994

Claims priority, application Japan, Aug. 29, 1989, 1-222623; Sep. 27, 1989, 1-251563; Sep. 27, 1989, 1-251564

Int. Cl.[5] B43L *13/00*; B65H *5/20*

U.S. Cl. 33—18.1 **10 Claims**

1. A sheet-driven type automatic drafting machine, comprising:

a sheet mounting member having opening means therein along a line in a Y axis direction of said machine;

drive roller means positioned in said opening means in said sheet mounting member, and a rotary drive mechanism connected to said drive roller means;

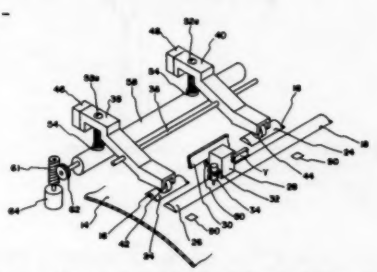
a Y axis rail extending in the Y axis direction above said sheet mounting member;

a line drafting head movably mounted on said rail for movement along said rail and means connected to said head for driving said head along said rail;

a shaft positioned above said sheet mounting member adjacent and parallel to said rail;

a first press roller arm pivotally mounted on said shaft for pivoting movement around said shaft at a predetermined position thereon;

a second press roller arm pivotally mounted on said shaft for pivoting movement around said shaft and for movement along said shaft;



said press roller arms each having a press roller at one end thereof engagable with a corresponding part of said drive roller means when said press roller arms are pivoted to move said one end toward said sheet mounting member for pressing a drafting sheet therebetween and enabling the drafting sheet to be driven in an X axis direction by said drive roller means;

arm elevating means engaged with said arms for pivotally driving said arms for separating said press rollers from said drive roller means;

a cursor movable along said Y axis rail and driven by said head driving means with said drafting head; and

an arm drive engagement body on said cursor engagable with said second press roller arm for driving said second press roller arm along said shaft in the Y axis direction.

5,182,862

INDICATING THREAD GAGE

Jimmy L. Frank, Houston; John R. Wolfe, Jr., Pasadena, and James R. Douglas, Cypress, all of Tex., assignors to Gagemaker, Inc., Pasadena, Tex.

Filed Apr. 12, 1991, Ser. No. 684,651

Int. Cl.[5] G01B *5/08, 5/12*

U.S. Cl. 33—199 R **18 Claims**

1. An indicating thread gage for tapered threads comprising:

an active block slidably engaged to a guide rail passing therethrough;

a biasing means for biasing the active block to a neutral position;

a fixed block engaged to the guide rail passing therethrough;

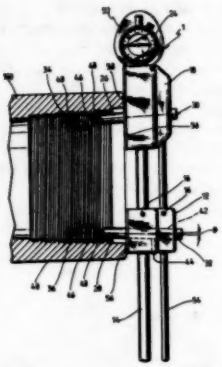
an indicator for transducing movement of the active block along the guide rail;

an active arm with one end secured to the active block;

a fixed arm with one end secured to the fixed block; and

a thread form element engaged with a section of the active arm not fixed in the active block;

a second thread form element engaged with a section of the fixed arm not fixed in the fixed block;



each thread form element biased to a neutral position, but capable of sliding movement along the active arm and fixed arm, respectively.

5,182,863

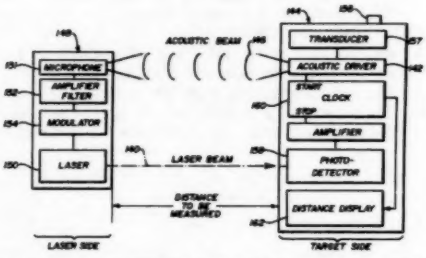
AUTOMATIC PLUMB AND LEVEL TOOL WITH ACOUSTIC MEASURING CAPABILITY

Joseph F. Rando, Los Altos Hills, Calif., assignor to Spectra-Physics Laserplane, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 602,353, Oct. 22, 1990, Pat. No. 5,075,977. This application Jun. 12, 1991, Ser. No. 714,240

Int. Cl.[5] G01C *1/02*

U.S. Cl. 33—227 **12 Claims**



1. A laser beam projecting device for plumbing, leveling, alignment and distance measuring, comprising,

a hand-carryable housing having at least two sides capable of resting stably on a flat surface, the two sides being substantially perpendicular to each other, and including two broad sides,

laser source means mounted within the housing, for producing at least one collimated beam of visible laser light,

a laser beam exit window in the housing, positioned in neither of two sides nor on said broad sides,

beam directing means in the housing for directing a beam from the laser source means vertically out of the housing through the exit window when a first side of said two sides is held generally horizontal, and for directing a beam from the laser source means horizontally out of the housing through the exit window when a second side of said two sides is held generally horizontal,

tilt compensation means in the housing and associated with the beam directing means for correcting for relatively small tilt angles of the housing as it rests with one of said two sides against surfaces not truly horizontal or not truly vertical, and for projecting the beam through the exit window in substantially true vertical orientation or substantially true horizontal orientation despite such relatively small tilt angles,

means associated with the laser beam projecting device for distance measuring, including:

means for characterizing at least one collimated beam of visible laser light produced at said laser source means, so that a modulated or pulsed beam is projected from said hand-carryable housing, and

a separate, unconnected component as a target means with photodetector means for receiving and detecting a modulated or pulsed laser beam projected from the hand-carryable housing, and with means for projecting an acoustic signal from the target means toward the hand-carryable housing,

acoustic signal receiver means in the hand-carryable housing for receiving an acoustic signal transmitted directly from the target means, without reflection, and

means coating between the hand-carryable housing and the separate target means, for measuring the time interval between transmission of the acoustic signal at the target means and receipt of the acoustic signal by the receiver means in the hand-carryable housing, with the means for characterizing, which causes a modulated or pulsed laser beam to be projected from the hand-carryable housing toward the photodetector means of the target means, being part of a response loop for measuring said time interval, and with associated means for calculating and displaying the distance between appropriate points on the hand-carryable housing and the target means in response to said measurement of the time interval.

5,182,864

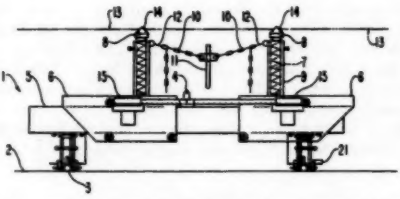
APPARATUS FOR MEASURING CAR FRAME

Ryuzo Yamashita, No. 53-9, Matsugaoka 3-chome, Funabashi-shi, Chiba-ken, Japan

Filed Sep. 12, 1991, Ser. No. 757,936

Int. Cl.[5] G01B *5/00*; **G01D** *21/00*

U.S. Cl. 33—288 **2 Claims**



1. An apparatus for measuring a car frame, comprising:

a pair of x-axis units extending in an x-axis direction of a car frame;

a y-axis unit mounted on said x-axis units for movement in an x-axis direction of a car frame and having a y-axis center piece provided at the center thereof between said x-axis units;

a pair of z-axis unit bases mounted on said y-axis unit for movement in a y-axis direction of a car frame;

a z-axis unit means mounted on each of said z-axis unit bases capable of being extended in a z-axis direction of a vehicle frame;

a z-axis center piece; and

a chain extending from said z-axis center piece to each z-axis unit means, said chains being equal in length.

5,182,865

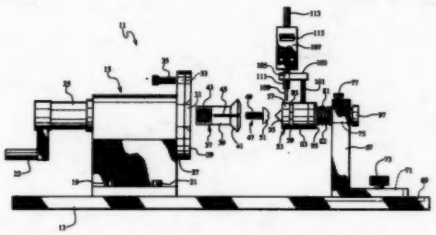
APPARATUS FOR MEASURING WORKPIECE CONCENTRICITY

Joe E. Greenslade, P.O. Box 330865, Fort Worth, Tex. 76163

Filed Jul. 14, 1992, Ser. No. 913,446

Int. Cl.[5] G01B *5/20*

U.S. Cl. 33—550 **24 Claims**



1. An apparatus for measuring the concentricity of a workpiece, the workpiece having a shank and a drive profile, comprising in combination:

a base;

a holder means mounted on the base and having an axis of rotation for releasably receiving the workpiece shank and for rotating the workpiece about the axis of rotation;

a follower member having an engaging profile for engaging the workpiece drive profile for rotation therewith, the follower member also having a symmetrical outer periphery and a contacting surface on an end opposite the engaging profile;

an engaging means carried by the base and opposing the holder means for biasing the engaging profile of the follower member against the workpiece drive profile, the engaging means having a contacting surface that slidingly contacts the contacting surface of the follower member, so that when the workpiece is rotated by the holder means the follower member is capable of planar motion relative to the contacting surface of the engaging means proportional to any non-concentricity of the workpiece; and

an indicator means carried by the base for measuring any workpiece non-concentricity, the indicator means having a spring-biased probe capable of linear extension and retraction which slidingly contacts the outer periphery of the follower member.

5,182,866

APPARATUS AND METHOD FOR IDENTIFYING THE LATERAL POSITION OF A WORKPIECE

Norbert Heymann, Dormagen, Fed. Rep. of Germany, assignor to GKN Automotive, Siegburg, Fed. Rep. of Germany

Filed May 14, 1991, Ser. No. 700,527

Claims priority, application Fed. Rep. of Germany, May 18, 1990, 4015957

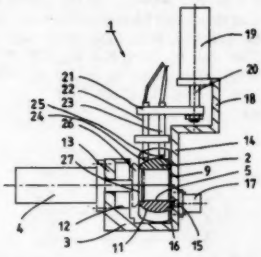
Int. Cl.[5] G01B *5/20, 7/28*

U.S. Cl. 33—645 **16 Claims**

1. A method of identifying the lateral position of a workpiece with a circularly enveloped outer contour in cross section and at least one asymmetric contour in longitudinal direction, especially a ball hub, comprising:

locating a workpiece in its position within a channel in a feeding assembly having a U-shape in cross section, defining a pair of parallel side walls and a bottom web with said channel therebetween, the axis of said outer contour of said workpiece lying transverse in said channel, said feeding assembly having a stationary sensor in one of the side walls;

scanning the contour of the workpiece with at least two movable spaced sensors positioned above the channel beside each other in transverse direction;



determining the difference in travel between the two movable sensors; and

identifying the lateral position of said workpiece.

5,182,867

POSITION MEASURING APPARATUS

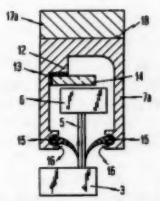
Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 4, 1992, Ser. No. 878,231

Claims priority, application 05111991, May 11, 1991, 91107677.6

Int. Cl.[5] G01B *11/04*

U.S. Cl. 33—702 **15 Claims**



1. A position measuring apparatus, for measuring the relative position of two objects, in an encapsulated position measuring arrangement, which comprises:

a probing means which is connected to a first object;

a support member which is connected to a second object wherein said support member and said second object have different coefficients of thermal expansion;

a measurement means arranged on said support member wherein said probing means probes said measurement means;

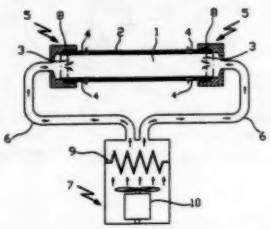
an auxiliary support member rigidly connected to said support member wherein said auxiliary support member is characterized by a coefficient of thermal expansion which is different from the coefficient of thermal expansion of said support member and further, wherein the cross-sectional dimensions of said auxiliary support member and said support members are determined so that a resulting structural combination of said auxiliary support member and said support member has a coefficient of thermal expansion which is substantially equal to the coefficient of thermal expansion of said second object.

5,182,868

METHOD AND APPARATUS FOR DRYING THE ENDS OF A BUNDLE OF HOLLOW FIBERS FOR A MEMBRANE DEVICE MADE UP OF HOLLOW FIBERS

Julien Porta, Chavanoz, and Christian Clermont, Morance, both of France, assignors to Hospal Industrie, Cedex, France

Filed Jul. 12, 1991, Ser. No. 729,387
Claims priority, application France, Jul. 13, 1990, 90 09199
Int. Cl.[5] F26B 7/00
U.S. Cl. 34—18 12 Claims



1. A drying method for drying the ends of a bundle of hollow fibers, the method comprising the steps of:

placing the bundle in a sheath having at least one axial opening and at least one lateral opening at each of its ends; and

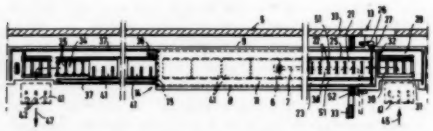
forcing in air simultaneously via the axial openings, with the inlet air flow rates to the sheath and the sizes of the openings being selected so that all of the air penetrating at each end of the sheath leaves via the corresponding lateral opening.

5,182,869

APPARATUS FOR COOLING SPENT ANODES OF ELECTROLYTIC MELTING BATHS

Erwin Collet, Lunen; Roland Rathgeber, Neub, and Udo Jerxsen, Toging, all of Fed. Rep. of Germany, assignors to Westfalia Becorit Industrietechnik GmbH, Lunen, Fed. Rep. of Germany

Filed Oct. 22, 1991, Ser. No. 780,196
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1990, 4033713
Int. Cl.[5] F26B 7/00
U.S. Cl. 34—20 25 Claims



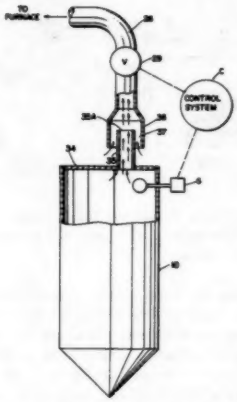
1. Apparatus for cooling anode rod assemblies, composed of spent anodes mounted on anode rods, removed from electrolytic furnaces; said apparatus comprising building structure defining an elongate cooling chamber, conveyor means for transporting the anode rod assemblies along the chamber and means for feeding cooling air into the chamber at least from a bottom region of the chamber and, means at the top region of the chamber for extracting heated together with any waste gases given off.

5,182,870

SYSTEM AND METHOD FOR RECOVERING VOLATILE ORGANIC GASES EMITTED FROM A POLYETHYLENE RESIN PRODUCT

Gaylon L. Dighton, and David G. Alvarez, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 30, 1990, Ser. No. 575,453
Int. Cl.[5] A26B 3/00
U.S. Cl. 34—26 9 Claims



1. An apparatus for handling substances which emit flammable materials which is designed to reduce emissions to the atmosphere of the flammable materials which comprises:

a vessel;

the vessel having means for venting its gas mixture to the atmosphere, said means for venting having an essentially perpetually open conduit between the flammable materials and the atmosphere;

means for air purging of the vessel;

a conduit means having an opening which communicates with the venting means of the vessel to draw the gas mixture from the venting means of the vessel to a gas mixture treatment means, said conduit means having valve means to permit said gas mixture from the venting means of the vessel to be alternatively released to the atmosphere;

means for detecting the composition of the gas mixture in the apparatus prior to the gas mixture treatment means;

a control means operably connected to the valve means in the conduit means and to the means for detecting the composition of the gas mixture;

wherein, the valve means is operated by the control means to assist in maintaining the composition of the gas mixture in the conduit means outside of the explosive range.

5,182,871

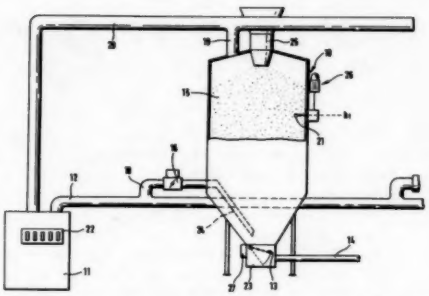
APPARATUS FOR DRYING BULK MATERIALS

Dieter Karls, Vaihingen, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Nov. 18, 1991, Ser. No. 793,563
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1990, 4037443
Int. Cl.[5] F26B 21/00
U.S. Cl. 34—54 9 Claims

1. An apparatus for drying bulk materials comprising a substantially cylindrical bulk material hopper having a funnel-shaped bottom end, a bulk material inlet in an upper portion of said hopper, a bulk material discharge device at the bottom of said hopper, an air inlet for introducing heated dry air adjacent

the bottom of said hopper, an air outlet for exhausting moisture-containing air adjacent the top of said hopper, means for feeding bulk material through said bulk material inlet, a temperature sensor disposed in said hopper at a location where a temperature gradient is established in said bulk material during normal operation of said apparatus for measuring the temperature of bulk material at said location, means connected to said



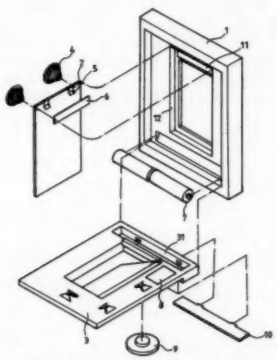
temperature sensor for preventing discharge of inadequately dried bulk material in response to adecrease in the measured temperature of said bulk material below a predetermined limit, a valve for regulating the introcution of heated dry air to said hopper and means connected to said temperature sensor for controlling said valve to decrease the flow of heated dry air to said hopper in response to an increase in the measured temperature of said bulk material above a predetermined upper limit.

5,182,872

SOUND PRODUCING CONTROL SWITCH FOR A PICTURE-FRAME

Larry Lee, Taipei Hsien, and Jack Kao, Nan Tou City, both of Taiwan

Filed Oct. 10, 1991, Ser. No. 774,324
Int. Cl.[5] G09F *1/12, 27/00;* **A63H** *33/38, 5/00*
U.S. Cl. 40—152 **1 Claim**



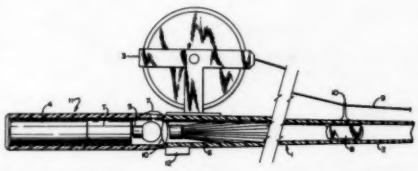
1. A sound producing control switch for a picture-frame having a back and a front, comprising:
- a picture-frame body having defined therein a show window, said show window having a back and a front;
- a conductive strip made from a thin, flat copper strip adhered to the back of said show window at an upper position;
- a sheet of glass covering said show window;
- two leaf springs clamped on said sheet of glass and disposed in contact with said conductive strip;
- a back cover covering the back of said picture-frame body;
- two springs means respectively secured to said two leaf springs and positioned against said back cover;
- a control circuit fastened in said back cover, the control circuit including two opposite terminals electrically connected to said two leaf springs, a battery power supply, a music IC and a speaker;
- wherein said conductive strip, show window, and leaf springs are arranged such that movement of said picture-frame body causes said two leaf springs to temporarily disconnect from said conductive strip, triggering said control circuit to produce a sound through said speaker, and wherein said spring means is arranged to automatically force said two leaf springs to contact said conductive strip immediately after said two leaf springs have been caused to disconnect from said conductive strip to prevent said sound from repeating.

5,182,873

MOTION SENSITIVE, FIBER OPTIC, STRIKE INDICATING FISHING ROD ASSEMBLY

William G. Aragon, Jr., 3181 W. 36th Ave., Denver, Colo. 80211

Continuation-in-part of Ser. No. 137,872, Dec. 24, 1987, abandoned. This application Jan. 19, 1990, Ser. No. 467,675
Int. Cl.[5] A01K *97/12*
U.S. Cl. 43—17 **14 Claims**



1. In a fishing rod assembly wherein a fishing rod includes a handle at one end and a fishing line is guided for extension along said rod, the improvement comprising:
- motion-sensing means in said rod responsive to motion in said fishing line imparted to said rod to generate an electrical signal;
- a light source and a portable power supply in said fishing rod;
- circuit means in said fishing rod between said portable power supply and said light source responsive to an electrical signal from said motion-sensing means to activate said light source; and
- a plurality of light-transmitting fiber optic elements extending through said rod having ends of said elements optically aligned with said light source for the transmission of light through said fiber optic elements when an electrical signal is generated by said motion-sensing means.

5,182,874

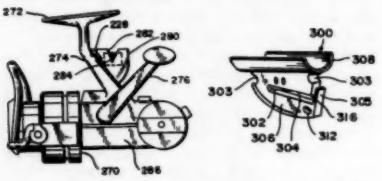
FISHING LINE CUTTER, AND ROD AND REEL THEREWITH

Timothy R. Powell, 2626 40th Ave. North, Texas City, Tex. 77590

Continuation-in-part of Ser. No. 453,823, Dec. 21, 1989, Pat. No. 5,025,585. This application Apr. 15, 1991, Ser. No. 685,538
Int. Cl.[5] A01K *87/00*
U.S. Cl. 43—25 **5 Claims**

1. A fishing reel comprising
- a reel body,
- a reeling mechanism on the reel body for reeling fishing line,
- an exterior handle engaging the reeling mechanism for operating said mechanism, and
- a fishing line cutter on the reel body, the fishing line cutter comprising
- a body member,

a cutting member attached to the body member for cutting the fishing line, a portion of the cutting member exposed in an opening in the body member, the opening suitable



for the entry therein of the fishing line so that the fishing line is movable to contact the cutting member,

at least one lip extending from the body member, the at least one lip partially blocking the opening.

5,182,875

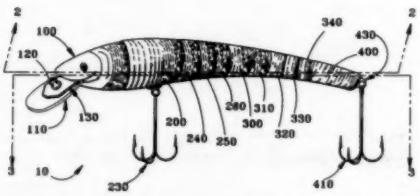
FLEXIBLE TYPE FISHING LURE

Randall D. Righetti, Upland, Calif., assignor to John Alexander Righetti, Pomona, Calif., a part interest

Filed Feb. 28, 1992, Ser. No. 843,178

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.24 **30 Claims**



1. A flexible fishing lure comprising:

a. a multisegmented body including a head segment, a tail segment, a neck segment, a tapered segment between the tail and the neck segment, and a plurality of segments in between;

b. each segment of said multisegmented body consist of a left half diametric section and a right half diametric section which are symmetrical by reflection across the plane which divides the two halves;

c. a thin flexible membrane which connects the left half diametric section and right half diametric section to form a generally series arrangement of segments;

d. an arrangement of said right and left half sections affixed to said flexible membrane, sandwiching the flexible membrane by the sections, and which provides a gap spacing between the segments which permits respective adjacent segments to move side to side in a generally serpentine manner as the lure moves through the water;

e. a generally air-foil type exterior surface for providing lift to said lure;

f. a flat spoon like diving bill structure positioned at the head segment of the lure which causes downward movement as the lure moves through the water;

g. a leader line attachment proximal to the diving bill structure;

h. a means for attaching the diving bill to the head segment of the lure, where the diving bill is attached by means of a bill plate which is secured by extending the bill plate into the head segment of the lure and thereby clamping the diving bill;

i. a center of gravity weight located at the neck of the lure;

j. at least one hook attachment at the tail segment of the lure; and

k. means for hingably attaching said at least one hook attachment to said tail segment.

5,182,876

BALANCED JIGGING LURE

Earl L. Lewis, 3840 Keokuk, St. Louis, Mo. 63116

Filed Jun. 10, 1991, Ser. No. 712,478

Int. Cl.[5] A01K *85/00*

U.S. Cl. 43—42.39 **3 Claims**

1. A balanced jigging lure for attachment to a fishing line used by a fisherman to catch a fish comprising:

a T-shaped shank with first and second arms and an elongated stem, said stem having first and second ends, said first end attached to the arms with a means for fixedly connecting the stem to the arms and said second end terminating in an eye, said eye spaced a substantial distance from said first and second arms, said means for connecting the stem to the arms forming a pivot point about which the jigging lure can be suspended b the eye in the stem in substantially horizontal position imitative of a baitfish; and,

a weighted head detachably connected to said first arm with means for detachably attaching and a barbed end section connected to the second arm by means for attaching, said weighted head and said barbed end section balanced about the pivot point by selecting the length of the arms, by selecting the weighted head and by selecting the barbed end section including and dressings and baits attached to the barbed end section whereby a large assortment of imitative jigging lures can be formed by interchanging various parts, wherein the means for detachably attaching the weighted head to the first arm comprise external threads on the first arm and mating internal threads in the weighted head.

5,182,877

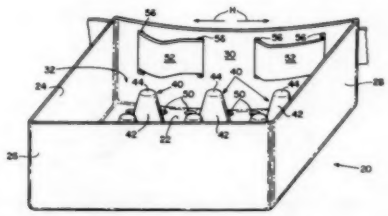
FISH LINE STRIPPING BASKET

Gary W. Burchill, 13 Sunnyfield Rd., Bedford, Mass. 01730; Frank E. Gillett, 24 Magazine St. #4; Rajan Ramaswamy, 57 Bishop Allen Dr. #1R, both of Cambridge, Mass. 02139, and Peter S. Winslow, 23 Rolfe's La., Newbury, Mass. 01951

Filed Jun. 30, 1992, Ser. No. 906,792

Int. Cl.[5] A01K *97/00*

U.S. Cl. 43—54.1 **30 Claims**



1. A fish line stripping basket comprising

a base wall,

one or more side walls,

a rear wall,

said walls together defining a volume open at the top, and said walls further defining a plurality of apertures for water to drain from within said volume,

means for releasable attachment of said basket upon the

body of a fisherman in a position to receive line stripped from a fishing reel, and

a multiplicity of slope-surfaced protuberances disposed in a spaced apart pattern upon said base wall and projecting upwardly within said volume.

5,182,878

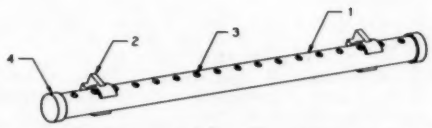
FISH LURE HOLDER

Brant V. Clark, 1103 York Rd., Cherry Hill, N.J. 08003

Filed Feb. 28, 1991, Ser. No. 662,450

Int. Cl.[5] A01K *97/06*

U.S. Cl. 43—57.1 **1 Claim**



1. A holder for barbed fish hooks or lures and suitable for mounting on a boat comprising:

a generally circular, hollow and tubular body having a plurality of openings, a length of from 1 foot to 25 feet, a diameter of from 0.25 inches to 5.5 inches and a wall thickness of from 1/32 of an inch to 1/74 of an inch;

each of said opening having a minimum opening of 0.06 inches and a maximum opening of less than 0.60 inches, and a distance between the center of adjacent openings of from 0.5 inches to 1.5 inches; and

means for mounting the bracket onto a boat with the openings in said body facing in a generally upward position, said mounting means comprising at least two brackets with the first and of each bracket having a mating surface for the circular cross section of said body and an opening to said mating surface that is less than the diameter of said body with said first end being made of a material sufficiently flexible to allow insertion of the body through said opening to said mating surface, and a second end of said bracket having means for affixing said bracket to the boat.

5,182,879

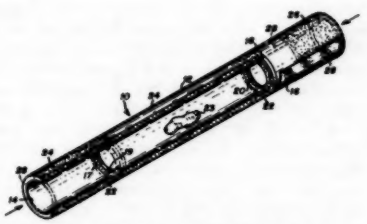
CRAWLING INSECT TRAP

George I. Hopkins, 1590 Spring Grove Rd., Hollister, Calif. 95023

Filed Oct. 3, 1991, Ser. No. 770,588

Int. Cl.[5] A01M *1/20*

U.S. Cl. 43—131 **20 Claims**



1. An insect trap comprising, in combination:

an elongated structure forming a passage-way for an insect;

a support member within the elongated structure and having a central opening for passage by an insect, the support member positioned to form surfaces substantially normal to the axis of the structure such that a path of travel of insects within the structure is through said central opening;

a bioactive compound impregnated on a surface of the support member, whereby as an insect penetrates about said central opening, it contacts the compound;

and a non-toxic, unpalatable compound coated about an exterior surface of the elongated structure whereby a child or animal is discouraged from the trap.

5,182,880

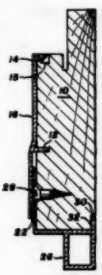
DOOR FRAME CLADDING APPARATUS

Richard H. Berge, Jr., Faribault, and Mark A. Larsen, Excelsior, both of Minn., assignors to New Morning Windows, Inc., Burnsville, Minn.

Filed Nov. 18, 1991, Ser. No. 793,201

Int. Cl.[5] E06B *1/04, 3/30*

U.S. Cl. 49—504 **2 Claims**



1. Cladding apparatus for covering a generally U-shaped opening in the outer wall of a structure, the door frame having inner surfaces about and perpendicular to the opening which is sized to receive a door, the door frame also having adjoining inner and outer surfaces which are perpendicular to the inner surface, the outer surface having a door nose which cover the entire surface, the door frame being prepared by having slits in the inner surfaces which are parallel to the adjoining inner and outer surfaces and extend inward perpendicular to the doorway inner surface, having keyways in the adjoining inner surfaces which are parallel to the inner surfaces and extend inward perpendicular to the adjoining inner surface, and having grooves in the adjoining inner surfaces which extend parallel to the inner surface from the inner surface to the keyway, the cladding apparatus comprising a rectangular sheet of rigid material having an inset of a predetermined length and width which extends from an edge of said sheet perpendicular to said sheet in a first direction, said inset terminating in a key means for engaging a keyway, the sheet also having a fin of a predetermined length and width extending in the first direction perpendicular to the surface of said sheet, the dimensions and spacing of said inset said fin and the arrangement of said key means being such that said sheet will cover the inner surface of the door frame and a predetermined portion of the door nose with the insert fitting within the groove in the adjoining inner surface, with the key means engaging the keyway in the adjoining inner surface, and with the fin engaging the slit in the inner surface.

5,182,881

AUTOMATED SPINDLE SLURRY SYSTEM

Jerry D. Cox, Cincinnati, Ohio; Raymond E. Linz, Wilmington; Jeanne M. Thome, Wrightsville Beach, both of N.C.; Winfield B. Perry, Lexington, Mass.; Franklin O. Hadley, Jr., Stoneham, Mass., and Vladimir A. Knobel, Brookline, Mass., assignors to General Electric Company, Cincinnati, Ohio

Filed Aug. 21, 1991, Ser. No. 748,130

Int. Cl.[5] B24B *31/06, 31/00, 1/04*

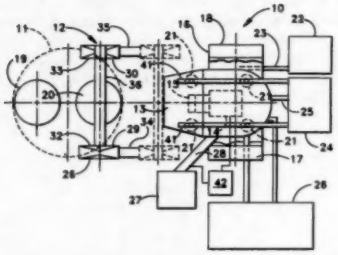
U.S. Cl. 51—7 **20 Claims**

15. A finishing machine for a gas turbine engine component, comprising:

a frame including a pair of spaced support members;

a spindle assembly pivotably mounted to said frame between said spaced support members for controllable driven motion in an arcuate path transverse to an axis of rotation of a spindle of said spindle assembly;

an open receptacle member disposed between said spaced support members and below said spindle assembly when said spindle assembly is in an elevated position relative to said receptacle member for receiving a component for



finishing, said open receptacle being capable of containing a volume of an abrasive slurry;

means for attaching the component to said spindle of said spindle assembly; and drive means for selectively moving said spindle and the attached component in rotary or oscillatory cycles about said spindle axis of rotation and simultaneously moving said spindle and the attached component in an arcuate path.

5,182,882

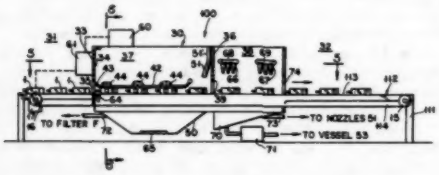
HEATER CORES HAVING EXPOSED SURFACES BURNISHED BY WET BLASTING

Timothy Brodene, East Amherst; Michael Plotner, Tonawanda, and Bruce Cramer, Buffalo, all of N.Y., assignors to FEDCO Automotive Components Co., Inc., Buffalo, N.Y.

Filed Dec. 30, 1991, Ser. No. 816,037

Int. Cl.[5] B24B *1/00*

U.S. Cl. 51—317 **19 Claims**



1. Apparatus for burnishing workpieces, comprising:

a conveyor for conveying workpieces in succession in a conveying direction along a path from a workpiece-loading station to a workpiece-unloading station;

an enclosed housing through which the conveyor travels along said path from the workpiece-loading station to the workpiece-unloading station, said housing having an input end at the workpiece-loading station and an output end at the workpiece-unloading station;

means at the ends of the housing respectively for admitting the conveyor and the successive workpieces on the conveyor into the housing from the workpiece-loading station and for exit of the conveyor and workpieces from the housing to the workpiece-unloading station;

said housing having blast and rinse chambers successively arranged along the path in the workpiece conveying direction;

nozzle means at the blast station for directing, under pressure, a stream of a slurry of abrasive particles in a liquid against at least portions of the successive workpieces conveyed along the path on the conveyor at the blast station to burnish said portions;

rinsing means at the rinse station for rinsing the successive workpieces on the conveyor as the workpieces are conveyed along said path through the rinse station;

a sump connected to the housing for collecting the slurry from the blast station after the workpieces have been burnished thereby;

means for recycling the slurry to said nozzles; and

means for chemically treating the slurry collected from the sump prior to recycling the slurry to said nozzles.

5,182,883

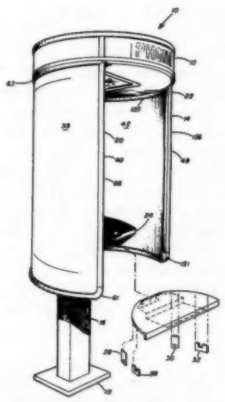
TELEPHONE ENCLOSURE

James R. Amberson, Richfield; William C. Ehlert, and George E. Olson, both of Minneapolis, all of Minn., assignors to Armco Inc., Middletown, Ohio

Filed Feb. 22, 1991, Ser. No. 660,341

Int. Cl.[5] E04H *1/14*

U.S. Cl. 52—73 **20 Claims**



1. A phone enclosure comprising:

an acoustic housing having an outer panel;

an inner panel;

an acoustic insulation panel; and

a body rail assembly, said body rail assembly comprising a first rail having a first rail base with an integral first leg, an integral second leg, an integral third leg and an integral fourth leg depending therefrom, said first leg positioned in spaced relation to said second leg and defining a first rail inner panel receiving slot therebetween, said third leg positioned in spaced relation to said fourth leg and defining a first rail outer panel receiving slot, said inner panel slideably received by said first rail inner panel receiving slot and said outer panel slideably received by said outer panel receiving slot, said first rail also having a first rail insulation receiving step integral to and depending from said first rail base, said step positioned between said second leg and said third leg wherein a first recess is defined between said second leg and said first rail step and a second recess is defined between said first rail step and said third leg wherein a first edge of said insulation panel abuts against said step and a first air gap is defined between said inner panel and said insulation panel and a second air gap is defined between said insulation panel and said outer panel.

5,182,884

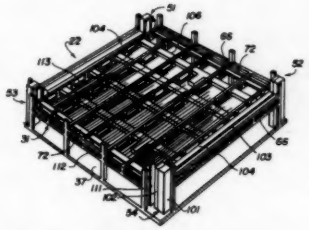
INTEGRATED BUILDING SYSTEM AND METHOD

Alexander G. Tarics, 29 Windward Rd., Belvedere, Calif. 94920

Filed Apr. 12, 1991, Ser. No. 684,298

Int. Cl.[5] E04B *1/34*

U.S. Cl. 52—79.14 **15 Claims**



1. In a building system, a plurality of interconnected building blocks, each of the building blocks having framing providing a horizontally disposed vertically spaced-apart floor, ceiling and ceiling plenum and having at least three vertically extending corners with at least certain of the corners having vertical shafts formed therein extending from the floor to the ceiling plenum, said vertical shafts having air handling ducts and piping and wiring disposed therein, the ceiling plenum having spaced-apart parallel framing members extending in one direction of the ceiling plenum, air handling ducts connected to the air handling ducts in the vertical shafts and disposed in the ceiling plenum running in directions parallel to the framing members in the ceiling plenum, and piping and wiring connected to piping and wiring in the vertical shafts and disposed in the ceiling plenum and running in directions different from the directions of the framing members in the ceiling plenum.

5,182,885

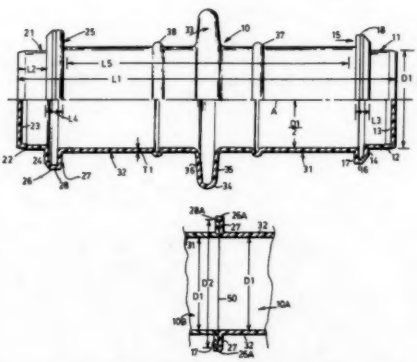
EXTENDABLE WALL SLEEVES

Bruce G. Barton, Jr., Whitmore Lake, Mich., assignor to Thunderline Corporation, Belleville, Mich.

Filed Jan. 25, 1991, Ser. No. 645,805

Int. Cl.[5] E04G *15/00*

U.S. Cl. 52—98 **10 Claims**



1. An improved construction for a unitary, one-piece molded resin wall sleeve precursor convertible into a wall sleeve assembly that forms a continuous unimpeded passageway of consistent internal diameter D1 through a concrete wall by cutting off end sections and transition sections from outer ends of sleeve sections of central sleeve members of each of two or more precursors and joining the sleeve members to each other, the precursor comprising:

first and second end sections, each end section including a cylindrical body portion having an external diameter D1 and a substantially flat mounting flange projecting radially outwardly of the axially inner end of the body portion of the end section;

and first and second transition sections joining the first and second end sections, respectively, to opposite ends of a central sleeve member, each transition section including an transition wall extending axially inwardly from an outer rim of the mounting flange of its end section and a substantially flat transition boundary wall extending radially inwardly from the outer transition wall to the central sleeve member;

in the improved construction, the transition wall of the first transition section has an outer diameter D2 and the transition wall of the second transition section has an inner diameter at least equal to D2, with D2>D1.

5,182,886

BUILDING ELEMENTS AND JOINTS THEREFOR

Colin N. Bateman, Stamford; Peter L. Clark, and William G. Carter, both of Nottingham, all of Great Britain, assignors to National Research Development Corporation, London, United Kingdom

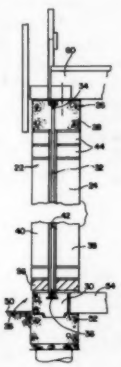
PCT No. PCT/GB89/00851, § 371 Date Jan. 22, 1991, § 102(e) Date Jan. 22, 1991, PCT Pub. No. WO90/01591, PCT Pub. Date Feb. 22, 1990

PCT Filed Jul. 27, 1989, Ser. No. 635,601

Claims priority, application United Kingdom, Aug. 2, 1988, 8818307; Aug. 2, 1988, 8818308

Int. Cl.[5] E04B *9/10*

U.S. Cl. 52—125.6 **7 Claims**



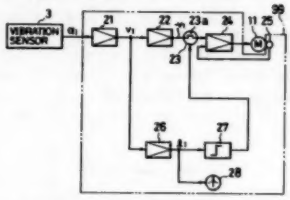
1. A transportable wall panel comprising horizontally extending top and bottom support beams, front and rear wall portions including masonry blocks provided between said beams, motor provided between said blocks, said front and rear wall portions defining a cavity therebetween, tensioning means provided between said top and bottom beams in the cavity defined between said front end wall portions, and a joint assembly for placement between adjacent wall panels at a building site, said joint assembly including joint elements associated with the marginal edges of the adjacent wall panels, each joint element defining a portion projecting into a space defined by a portion of an adjacent joint element to form a labyrinth therebetween, said joint elements extending generally parallel the marginal edges of the wall portions adjacent said joint elements.

5,182,887

VIBRATION DAMPING SYSTEM

Nayomon Uno, Hasuda, and Masao Mutaguchi, Yotsukaidou, both of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1989, Ser. No. 394,043
Claims priority, application Japan, Oct. 6, 1988, 63-250955
Int. Cl.[5] G21C *17/00*
U.S. Cl. 52—167 R **10 Claims**



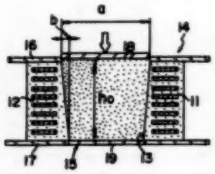
1. A structure vibration damping system, comprising:
a weight disposed at the top of the structure;
means for allowing the weight to perform simple harmonic oscillation;
a vibration sensor attached to the structure for detecting vibration of the structure;
a weight driving mechanism for actuating the weight; and
means for controlling movement of the weight such that the weight performs a single harmonic oscillation at a 90-degree phase delay relative to the vibration of the structure when the vibration amplitude of the structure exceeds a predetermined limit value whereby oscillation of the weight serves as an attenuation force against the structure vibration.

5,182,888

EARTHQUAKE-PROOFING DEVICE OF PERIPHERALLY RESTRAINED TYPE

Yoshiaki Miyamoto, Takarazuka, Japan; Teruo Sasaki; Kazuhiro Fujisawa, both of Kobe, and Seinosuke Kato, Nishinomiya, all of Japan, assignors to Sumitomo Gomu Kogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 31, 1990, Ser. No. 560,629
Claims priority, application Japan, Aug. 1, 1989, 1-91283[U]; Jul. 13, 1990, 2-185581[U]
Int. Cl.[5] E04B *1/98*
U.S. Cl. 52—167 DF **13 Claims**



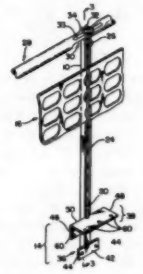
1. An earthquake-proofing device of peripherally restrained type comprising:
a laminate constructed by alternately laminating rigid plates and rubber-like elastic plates, said laminate being formed with a cylindrical hollow portion open at opposite vertical ends;
flanges formed on opposite ends of said laminate;
a visco-elastic body inserted into said cylindrical hollow portion and filling said hollow portion, wherein a volume of said visco-elastic body is greater than a volume of said cylindrical hollow portion by an amount equal to a product of that portion of an inner surface area of said cylindrical hollow portion opposed to said rubber-like elastic plates and 5–60% of a thickness of a single rubber-like elastic plate of said rubber-like plates; and
pressure receiving plates located on opposite ends of said visco-elastic body wherein when assembled for use, said pressure receiving plates being adjacent to said flanges when said visco-elastic body, having said greater volume, is compressed into said cylindrical hollow portion.

5,182,889

BARRIER SYSTEM

Dennis Johnson, 21202 139th Ave. SE., Snohomish, Wash. 98290

Filed Jan. 14, 1991, Ser. No. 641,753
Int. Cl.[5] E02D *27/42*
U.S. Cl. 52—298 **10 Claims**



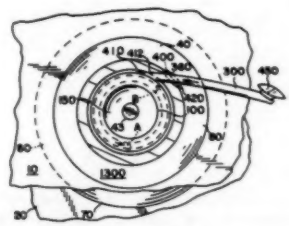
1. A barrier system, said barrier system comprising:
a plurality of elongated bodies, each said body having a length, sides, a top, and a bottom;
a bracket system, said bracket system being used to affix each said elongated body to a structure where a barrier is desired, so that each said elongated body length is substantially normal to the ground; and
an attachment mechanism, said attachment mechanism being used to fixedly, but removably, attach webbing to said elongated bodies to create a barrier, said attachment mechanism also having a plurality of locking pins, said attachment mechanism attaching said webbing to each said elongated body with one said locking pin for each said elongated body.

5,182,890

ATTACHMENT PLATE FOR ROOFING SHEETS

William H. Peters, P.O. Box 184, W. Unity, Ohio 43570

Filed Jul. 24, 1990, Ser. No. 557,549
Int. Cl.[5] E04D *5/14*
U.S. Cl. 52—410 **4 Claims**



1. A fastening plate apparatus for fastening a rubber roof sheet to the upper surface of a roof deck comprising:
(a) a fastening plate member having an upper surface and a lower surface, said fastening plate having on its upper surface a cup-like member with an opening on the upper

part leading to an internal cavity in such cup-like member, having an outer circumferential surface, with such fastening plate member having an opening extending from such cavity to the lower surface of said plate member, and wherein said cup-like member has a circumferentially extending groove on its outer circumferential surface, and wherein said cup-like member is adapted to receive thereover a portion of a rubber roof sheet;

(b) outer cap-like means comprising a solid, pliable material having an outer circumferential surface into which outer circumferential surface is formed an opening, said outer cap-like means being adapted to fit over said cup-like member on said plate member;

(c) circumferentially extending fastening means with a frontal end and a posterior end adapted to be inserted into opening in said cap means to lock a portion of a rubber roof sheet against the fastening plate, such circumferentially extending fastening means having enlarged diameter means with a notched surface on its posterior end;

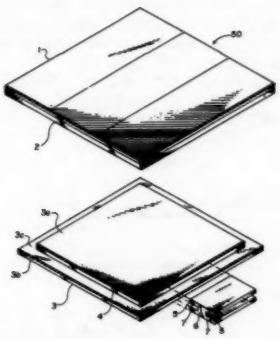
(d) inner cap-like means formed of a flexible material adapted to fir conformingly over said cup-like member and over said rubber roof sheet.

5,182,891

RAISED INSULATED AND WATER RESISTANT COMPOSITE FLOORING MATERIAL

Donald Slocum, 61 Chimney Ridge Dr., Convent Station, N.J. 07961

Filed Jul. 20, 1990, Ser. No. 556,652
Int. Cl.[5] E04B *9/28*
U.S. Cl. 52—480 **7 Claims**



1. A flooring comprising:

at least one flooring panel including a rigid layer forming a top of said flooring panel an insulating layer attached to said rigid layer forming a bottom of said flooring panel and an additional pre-finished layer above said rigid layer, said additional layer having a surface of enhanced appearance, said flooring panel defining a horizontal channel formed in opposite vertical ides of said flooring panel;

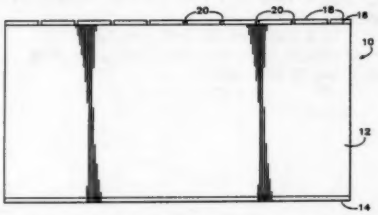
support means including at least two interlock support beams, each interlock support beam having a vertical web and at least one horizontal flange, said vertical web resting on a surface to be floored and rising up from the surface to be floored, said horizontal flange being positioned on top of aid vertical web forming an overhang on at least one side, said horizontal flange of a first beam and a horizontal flange of another beam engaging said horizontal channel of said two opposite vertical sides respectively and defining a pair of interlock support beams said horizontal flanges provide support for said flooring panels on both of said opposite vertical sides, for supporting said flooring panel above said surface to be floored providing a raised flooring, said interlock support beams have said horizontal flanges on both sides of the vertical web and said horizontal flanges on each side of said vertical web are used in attaching said interlock support beam to an adjacent floor panel via engagement into said horizontal channel.

5,182,892

TONGUE AND GROOVE BOARD PRODUCT

Peter D. Chase, Houlton, Me., assignor to Louisiana-Pacific Corporation, Hayden Lake, Id.

Filed Aug. 15, 1991, Ser. No. 746,228
Int. Cl.[5] E04F *15/02*
U.S. Cl. 52—539 **29 Claims**



1. A tongue and groove board, comprising:

first and second major surfaces;

first and second longitudinal edges;

said first longitudinal edge including means defining a longitudinally-extending groove extending inwardly of said longitudinal edge between said first and second major surfaces;

a tongue protruding from said second longitudinal edge, said tongue having an outer portion including longitudinally-extending upper and lower surfaces;

said outer portion of said tongue for being received within and interconnectingly engaging a complimentary longitudinal groove formed in a first longitudinal edge of an adjacent tongue and groove board for interconnecting said adjacent tongue and groove boards;

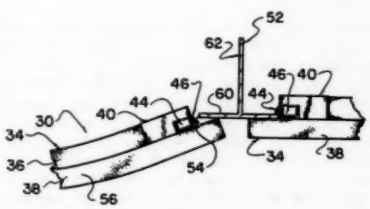
said protruding tongue having at least one substantially vertically-extending opening extending through said protruding tongue from said longitudinally-extending upper surface to said longitudinally-extending lower surface for providing at least one drain path for water to drain by gravity in a generally downwardly direction from said first major surfaces of said interconnected adjacent tongue and groove boards to a space below, thereby preventing an accumulation of water on said first major surfaces of said interconnected adjacent tongue and groove boards.

5,182,893

PANEL, CLIP AND METHOD OF MOUNTING PANEL

John P. Goodworth, 7617 Stone Rd., Medina, Ohio 44256

Division of Ser. No. 564,195, Aug. 8, 1990, Pat. No. 5,123,225.
This application Mar. 13, 1992, Ser. No. 850,580
Int. Cl.[5] E04B *1/00*
U.S. Cl. 52—745.05 **10 Claims**



1. A method comprising the steps of providing a panel hav-

ing a plurality of retaining elements, aligning the panel with an opening in a support structure, and engaging the support structure with the retaining elements to hold the panel against movement relative to the support structure, said step of engaging the support structure with the retaining elements including resiliently flexing the panel.

5,182,894

PACKAGING METHOD AND APPARATUS

Frederick D. Bate, Colne, United Kingdom, assignor to Elmwood Packaging Machinery Ltd., England

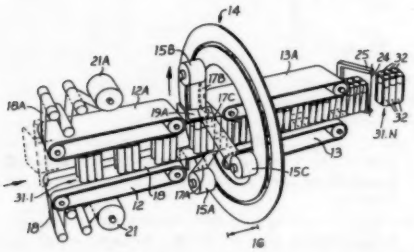
PCT No. PCT/GB90/00266, § 371 Date Aug. 9, 1991, § 102(e) Date Aug. 9, 1991, PCT Pub. No. WO90/09316, PCT Pub. Date Aug. 23, 1990

PCT Filed Feb. 16, 1990, Ser. No. 741,479

Claims priority, application United Kingdom, Feb. 18, 1989, 8903753; Aug. 2, 1989, 8917667

Int. Cl.[5] B65B *13/04*

U.S. Cl. 53—399 **17 Claims**



1. A method of packaging articles comprising the steps of:

feeding articles in groups of lesser length than a gap between in-feed and out-feed conveyors for the articles, said articles being stood upright in said groups to be packaged together, said groups being spaced in the direction of feeding, said gap being conveyor-free;

engaging said groups of articles with a band of highly flexible packaging sheet material that is continuous from group to group and moves across said gap in the direction of feeding with said spaced groups of upright articles;

causing said band of material to exert a tractive force on said engaged groups of articles and to draw said groups of articles across said gap; and

helically wrapping a highly flexible and stretchable sheet material about said groups of articles and said band in said gap, so that the band and the groups of articles are incorporated into overall packaging of the groups of articles.

5,182,895

SHOPPING BAG SYSTEM AND METHOD

Nicolas R. Lugo, 1521 Bellevue Ave. #105, Seattle, Wash. 98122

Filed Apr. 2, 1992, Ser. No. 863,593

Int. Cl.[5] B65D *25/14, 30/00;* B60R *11/00;* B65B *61/14*

U.S. Cl. 53—469 **20 Claims**

19. A method of carrying shopping items, comprising the following steps:

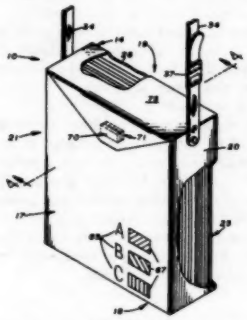
a. selecting a carrier containing set of shopping bags, said set of shopping bags comprising a plurality of folded bag structures stacked on edge horizontally therein, each said bag structure having size identification means printed thereon which is visible when said bag structures are stacked inside said carrier, said carrier having an attached cart attachment means which enables said carrier to be selectively attached to a shopping cart when shopping;

b. selecting one said bag structure from said set of shopping bags carried inside said carrier using said size identification code printed on each said bag structure for carrying shopping items;

c. filling the selected said bag structure with said shopping items;

d. repeating steps (b) and (c) as needed until all of said shopping items are placed into said bag structures;

e. transporting said shopping items to a desired destination;



f. removing said shopping items from each said bag structure, and;

g. folding each said bag structure into a compact shape and stacking each said bag structure on edge inside said carrier so that said size identification means is visual to a user of said system.

5,182,896

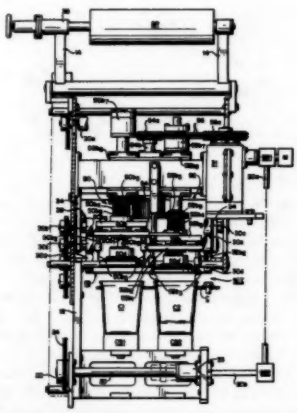
APPARATUS AND METHOD FOR HEAT-SEALING A FILM COVER TO OPEN ENDED CONTAINERS

Larry Maccherone, Severna Park, Md., assignor to Sweetheart Cup Company Inc., Owings Mills, Md.

Filed Sep. 9, 1991, Ser. No. 756,189

Int. Cl.[5] B65B *51/10*

U.S. Cl. 53—478 **15 Claims**



14. Method for heat-sealing a film cover to an open-ended container comprising the steps of:

supplying fresh film stock to a sealing and cutting zone, and retrieving from the sealing and cutting zone waste web which remains after the film cover has been cut from the fresh film stock;

moving at least one open-ended container into registry with a portion of the fresh film stock in the sealing and cutting zone;

heat-sealing a circumferential region of the fresh film stock

portion to the open end of the container in registry therewith; and

orbitally cutting the heat-sealed circumferential region from the fresh film stock portion to thereby form the film cover which is heat sealed to the open-ended container; wherein

said step of cutting the film stock includes orbitally moving at least one knife blade circumferentially adjacent the open end of the container, whereby said fresh film stock is cut; and wherein

said step of orbitally moving said at least one knife blade is practiced by orbitally moving the at least one knife blade along a substantially circular path; and wherein

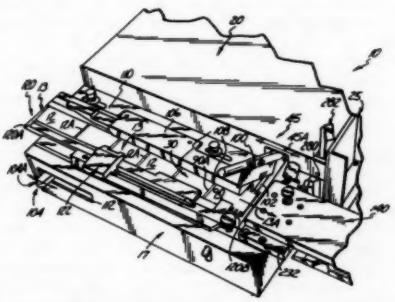
said step or orbitally moving said at least one knife blade is practiced by orbitally moving the at least one knife blade along an arcuate non-circular path which is coextensive with the circular path, thereby forming a protruding tab on the film cover.

5,182,897

SLIDE MOUNTER WITH MOVABLE KNIFE ASSEMBLY

Wilbur Gerrans, Marysville, Wash., assignor to Pakon, Inc., Minnetonka, Minn.

Filed Jan. 15, 1992, Ser. No. 821,025
Int. Cl.[5] B65B *5/04, 63/00, 61/06*
U.S. Cl. 53—520 **11 Claims**



1. An apparatus for severing individual film transparencies from a longitudinally supported photographic film web to prepare a photographic slide, the apparatus comprising:

a movable knife assembly aligned with and operably supported for longitudinal movement toward and away from the longitudinally supported film web, the movable knife assembly having upper and lower knife blades connected to operate between an opened position and a closed position, in the opened position the upper and lower blades being separated to define a receiving opening for advancing film and in the closed position, the blades being in close relation to sever the film;

means for moving the knife assembly to longitudinally adjust the position of the movable knife assembly relative to the supported photographic film web;

means for longitudinally moving the photographic film web along an advancement stroke to advance a leading film transparency toward the movable knife assembly for operation; and

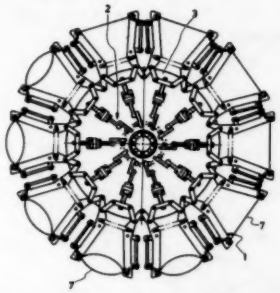
means for gauging an adjusted position for the movable knife assembly relative to the supported film web and the film advancement stroke so that the trailing edge of the leading film transparency is aligned with the upper and lower knife blades when advanced for operation.

5,182,898

BAGGING SPECIFICATION ADJUSTMENT AND AUTOMATIC INWARD-CONTRACTION AND OUTWARD-EXPANSION MECHANISM FOR BAGGING MACHINE

Fu-Ching Tung; Chi-Tsun Chen, and Sheng-Feng Lieu, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchum, Taiwan

Filed Nov. 12, 1991, Ser. No. 791,032
Int. Cl.[5] B65B *43/16*
U.S. Cl. 53—570 **2 Claims**



1. An apparatus for packaging materials into bags, wherein each bag is picked up at one station, opened at a successive station, filled with a material at another successive station, thermally sealed and then released at successive stations which comprises in combination a frame (**504**), a main support base (**6**), a worm and gear mechanism (**5**), a groove cam mechanism (**4**), a claw support mechanism (**3**), a steering mechanism (**2**), a claw mechanism (**1**), a feeding means and a thermal sealing means, said main support base (**6**) comprising a first strut (**601**), a bearing (**602**) and shaft (**9**), said worm and gear mechanism comprising a worm (**501**) and a worm gear (**502**), said groove cam mechanism (**4**) comprising a cylindrical groove cam (**401**) with groove (**404**), a guide rod (**402**) and thread rod (**403**), said guide rod (**402**) being secured to said frame (**504**), the claw support mechanism (**3**) comprising a second strut (**302**), guide (**303**), support plate (**301**), rocking shaft seat (**304**) and clamping ring (**305**), the steering mechanism (**2**) comprising steering block of L-shape (**201**), spring (**202**), a plunger rod (**203**) and support roller (**204**), the claw mechanism (**1**) comprising claw arms (**101**), spring (**102**), coupling rods (**103**), driving rod (**104**), push and pull rod (**105**), bar linkage (**107, 108, 109, 112**), said plunger rod (**203**) being connected to said push and pull rod (**105**), a hollow shaft (**8**), said frame (**504**) supporting the groove cam mechanism (**4**), said first strut (**601**) supporting the worm and the gear mechanism (**5**) and said support plate (**301**) of said claw support mechanism (**3**), said bearing (**602**) supporting said first hollow shaft (**8**), said hollow shaft (**8**) being connected to said support plate (**301**), said hollow shaft (**8**) being retained by said clamping ring (**305**) for rotation around said shaft (**9**), said second strut (**302**) supporting the claw mechanism (**1**), said guide (**303**) maintaining said push and pull rod (**105**) in motion, said seat (**304**) supporting said L-shape steering block (**201**), said worm (**501**) being connected to said thread shaft (**403**) whereby when the worm (**501**) is rotated, it drives said worm gears and said thread shaft (**403**), it drives said worm gear (**502**) and said thread shaft (**403**) whereby said cylindrical groove cam (**401**) moves up or down, whereby said plunge rod (**203**) moves up or down, and said push and pull rod (**105**) moves forward or in reverse, and when the push and pull rod (**105**) moves forward, it pushes said driving rods (**104**) of said bar linkage and said coupling rods (**103**), and said claw arms (**101**) are expanded outwardly, and when the push and pull rod (**105**) reverses its motion, said driving rods (**104**) and said coupling rods (**103**) force said claw arms (**101**) to contract inwardly, whereby the distance between the claw arms (**101**) is

adjusted to fit the specification of each bag, and when said driving roller (112) of said feeding means gears said bar linkage, said claws (106) of said bar linkage open and release each bag and close at a successive station.

5,182,899

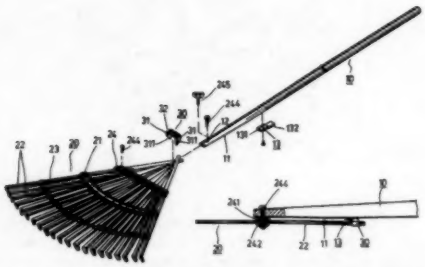
RAKE CONNECTION ASSEMBLY

Han-Ching Sun, No. 43, Ta-An Rd., Tien-Chung Chen, Changhwa Hsien, Taiwan

Filed Jan. 6, 1992, Ser. No. 817,358

Int. Cl.[5] A01D 7/06

U.S. Cl. 56—400.17 3 Claims



1. A rake having a long handle and a projecting prong section generally shaped in the form of a sector, said projecting prong section being attached to a lower end portion of said handle at an upper end portion thereof and including a plurality of prongs, an upper clamping sheet and a lower clamping sheet, said upper and lower clamping sheets holding said prongs therebetween, characterized by:

said upper clamping sheet having several holes formed therethrough and several recesses formed in a bottom surface thereof;

each of said prongs having a hole formed therethrough;

said lower clamping sheet including several threaded holes formed therein in alignment with said holes of said upper clamping sheet, and several tongues projecting from said lower clamping sheet to pass through said holes of said prongs, each of said tongues having an upper end portion which is engaged in one of said recesses so as to position said prongs between said upper and lower clamping sheets;

said handle having a fastener hole formed through a lower end thereof;

several bolts extending through said holes of said upper clamping sheet to engage in said threaded holes of said lower clamping sheet so as to clamp said prongs between said upper and lower clamping sheets, one of said bolts extending through said fastener hole of said handle in such a manner that said lower end portion of said handle is located above said upper and lower clamping sheets;

a generally U-shaped retaining member having two parallel legs, an upper plate portion interconnecting upper ends of said legs and pressed to form a retaining hole in an upper end of said retaining member, and two ends bent inwardly so as to form a rectangular loop, thereby clamping upper ends of said prongs in said retaining member; and

a generally Z-shaped connecting sheet having an upper plate portion fastened to a lower portion of said handle, a lower plate portion inserted into and confined within said retaining hole of said retaining member, and a connecting portion interconnecting said upper and lower plate portions of said connecting sheet.

5,182,900

METHOD AND APPARATUS FOR CHECKING THE OPERATION OF A PNEUMATIC SPLICER

Dieter Horak, Mönchengladbach, and Hans-Heinz Schäfer, Schwalmtal, both of Fed. Rep. of Germany, assignors to W. Schlafhorst AG & Co., Mönchengladbach, Fed. Rep. of Germany

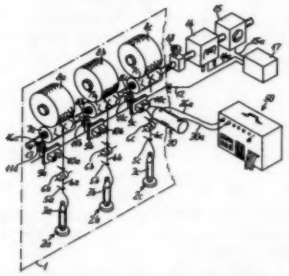
Continuation of Ser. No. 632,547, Dec. 24, 1990, abandoned.

This application Mar. 31, 1992, Ser. No. 863,506

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942864

Int. Cl.[5] D01H 13/26; G01F 15/18

U.S. Cl. 57—22 21 Claims



1. A method for checking the operation of a pneumatic splicer at a textile machine, the pneumatic splicer having a splicer head with a splicing conduit for joining two yarn ends and a splicing gas injection opening for injecting splicing gas into the splicer head, the splicing conduit being means for receiving the injected splicing gas injected through the injection opening, the method which comprises:

feeding splicing gas for a predetermined period of time to a splicer to be checked for splicing a particular yarn batch without having yarn ends laid in place in the splicing conduit of the splicer head of the splicer to be checked;

measuring at least one status variable of the injected splicing gas at a location downstream of the injection opening during the predetermined period of time;

measuring a reference value at another splicer identical to the splicer to be checked, the other splicer producing replicable spliced joints meeting a previously defined quality, by feeding splicing gas to the other splicer without yarn ends being laid in place in the splicing conduit and measuring the reference value of injected splicing gas at a location downstream of the injection opening;

comparing the at least one status variable with the measured reference value and ascertaining deviations;

using the magnitude of the deviations as a basic criterion for evaluating the operation of the splicer to be checked; and, if the splicer does not meet a predetermined condition for satisfactory operation, brining the checked splicer into the condition for satisfactory operation.

5,182,901

SPINNING OR TWISTING SPINDLE ARRANGEMENT

Fritz Stahlecker, Bad Übergkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest

Filed Jun. 13, 1990, Ser. No. 537,240

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1989, 3920019

Int. Cl.[5] D01H 7/04, 7/08; F16C 17/10

U.S. Cl. 57—135 15 Claims

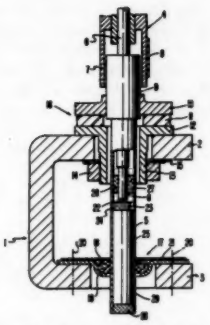
1. A spinning or twisting spindle arrangement comprising:

a spindle shaft,

a spindle bearing housing accommodating a bearing for the spindle shaft, said spindle shaft being radially fixed in the spindle bearing housing,

a spindle rail including upper and lower axially spaced flanges,

and holding devices at each of said flanges for holding the spindle bearing housing, each of the holding devices including rubber-elastic elements disposed between the flanges and the spindle bearing housing so as to prevent a



metallic connection between the spindle bearing housing and the flanges while permitting radially swinging movements of the spindle bearing housing,

wherein the holding devices at at least one of the upper and lower flanges includes radial aligning devices for accommodating selective adjustment of radial alignment of the spindle housing relative to the respective flange.

5,182,902

PROCESSING ROBOT FOR A TWO-FOR-ONE-ONE TWISTER

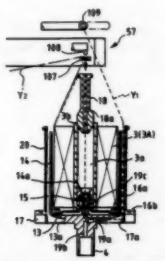
Hiroshi Mima, Joyo; Tadashi Suzuki, Uji, and Yasuhiko Kubota, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Division of Ser. No. 494,145, Mar. 14, 1990. This application May 1, 1991, Ser. No. 694,403

Claims priority, application Japan, Mar. 17, 1989, 1-63857; Mar. 20, 1989, 1-66379; Mar. 28, 1989, 1-73863; Mar. 28, 1989, 1-73865

Int. Cl.[5] D01H *15/00*

U.S. Cl. 57—279 **3 Claims**



1. A method of threading a yarn feed package, the yarn feed package defining an axial bore and an outer portion, the axial bore defining a longitudinal axis, the method comprising:

inserting a tenser cap into the axial bore, the tenser cap defining a passage including an opening;

drawing a yarn end from the yarn feed package;

applying a first suction force through the axial bore and the passage;

moving the yarn end to a position in spaced relation to the opening;

positioning an air nozzle in spaced relation to the opening; and

directing a stream of air from the air nozzle towards the opening and substantially along the longitudinal axis of the axial bore such that the yarn end is directed towards the axial bore and engaged by the first suction force.

5,182,903

OPEN-END SPINNING MACHINE

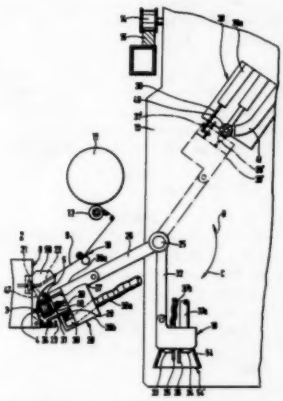
Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany, a part interest

Filed Feb. 19, 1992, Ser. No. 836,761

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1991, 4107403

Int. Cl.[5] D01H *11/00*

U.S. Cl. 57—301 **23 Claims**



1. An open-end spinning machine comprising:

a plurality of spinning units arranged in a row which each comprise an opening roller,

and movable servicing apparatus carrying cleaning elements which can be applied to respective ones of the opening rollers for carrying out preventative cleaning without interrupting spinning operations at the associated spinning unit.

wherein a control device is assigned to the cleaning elements which controls a first preventative cleaning operation without interrupting spinning operations at the associated spinning unit when the servicing apparatus is moving and a second preventative cleaning operation without interrupting spinning operations at the associated spinning unit when the servicing apparatus is stopped, said first cleaning operation being different than the second cleaning operation.

5,182,904

GAS TURBINE ENGINE POWER UNIT

John F. Coplin, Derby, England, assignor to Rolls-Royce Business Ventures Limited, Derby, England

Filed Nov. 14, 1991, Ser. No. 791,404

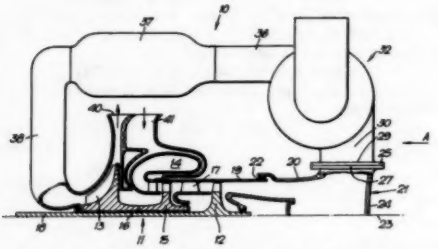
Claims priority, application United Kingdom, Dec. 14, 1990, 9027161

Int. Cl.[5] F02C *3/04, 7/10*

U.S. Cl. 60—39.161 **5 Claims**

1. A gas turbine engine power unit comprising a gas generator, a plurality of heat exchangers to facilitate recuperative operation of said gas generator, a plurality of turbo-chargers adapted to boost the air supply to said gas generator, and a valve to receive the exhaust efflux of said gas generator and to direct said efflux to one of said heat exchangers and said turbochargers to drive said turbochargers, said valve comprising

two circular cross-section ducts arranged coaxially with radially abutting faces, each of said radially abutting faces having apertures therein, said ducts being relatively movable between a first position in which said apertures are so aligned as to permit the passage of said exhaust efflux only to said heat



exchangers, and a second position in which said apertures are so aligned as to permit the passage of said exhaust efflux only to said turbochargers to drive said turbochargers, said heat exchangers and turbochargers being located around the periphery of said power unit in circumferentially alternating relationship.

5,182,905

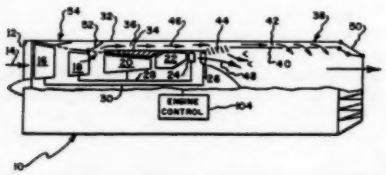
METHOD FOR AUTOMATIC BYPASS OPERATION

Larry W. Stransky, West Chester; Valentine R. Boehm, Jr., and Michael A. Phillips, both of Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 522,024, May 11, 1990. This application Nov. 18, 1991, Ser. No. 793,984

Int. Cl.[5] F02K *3/04*

U.S. Cl. 60—204 **4 Claims**



1. In a variable bypass turbofan engine having a bypass duct surrounding a core engine, a fan disposed in flow communication with said bypass duct and said core engine, and a hinged valve door positionable between open and closed positions in said bypass duct, a method of controlling airflow through said bypass duct comprising generating differential pressure between said fan and said bypass duct and automatically positioning said valve door in response to said differential pressure across said valve door.

5,182,906

HYBRID SPINNER NOSE CONFIGURATION IN A GAS TURBINE ENGINE HAVING A BYPASS DUCT

Alan R. Gilchrist; Thomas J. Sullivan, both of Fairfield, and Roger C. Walker, Middletown, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 600,788, Oct. 22, 1990, abandoned. This application Apr. 3, 1992, Ser. No. 864,189

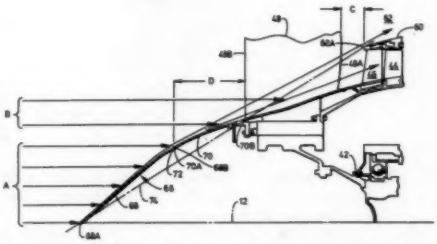
Int. Cl.[5] F02K *3/00*

U.S. Cl. 60—226.1 **12 Claims**

1. In a gas turbine engine having a forward rotor, a row of circumferentially spaced fan blades attached to and extending radially outward from said rotor, a core turbine engine located rearwardly of said fan blades and rotor and being coupled to said rotor for rotatably driving said rotor, an outer annular nacelle surrounding said rotor, fan blades, and core engine, and an inner annular splitter fairing disposed rearwardly from said fan blades, surrounding said core engine and spaced radially inwardly from said nacelle so as to define therebetween a bypass air flow duct located outwardly from said core engine and rearwardly of said fan blades for producing thrust upon rotation of said rotor and fan blades therewith, a hybrid spinner nose having a central axis and being attached about said rotor and projecting forwardly therefrom and forwardly of said fan blades, said hybrid spinner nose comprising:

(a) a forward nose portion spaced forwardly of said row of fan blades and terminating in a forward end;

(b) a rearward nose portion projecting forwardly of and merging rearwardly with said row of fan blades; and



(c) a transition located between and interconnecting said forward and rearward nose portions in a tandem arrangement with said transition as viewed along the central axis of the spinner nose being spaced approximately midway between said forward end of said forward nose portion and said row of fan blades such that the portion of said spinner nose forwardly of said row of fan blades has a compound conical configuration in which overall slope of said forward nose portion is greater than overall slope of said rearward nose portion relative to said central axis of said spinner nose.

5,182,907

SYSTEM FOR MONITORING PERFORMANCE OF HC SENSORS FOR INTERNAL COMBUSTION ENGINES

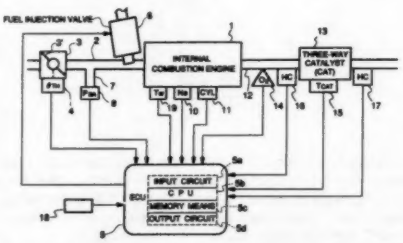
Shigetaka Kuroda, and Yoichi Iwata, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1991, Ser. No. 755,088

Claims priority, application Japan, Sep. 5, 1990, 2-236851

Int. Cl.[5] F02D *41/14*

U.S. Cl. 60—276 **7 Claims**



1. A system for monitoring the performance of at least one HC sensor provided in an internal combustion engine having an exhaust passage, the at least one HC sensor being arranged in said exhaust passage for detecting concentration of hydrocarbons present in exhaust gases from said engine, said system comprising:

memory means for storing a value of output from said at

least one HC sensor assumed when fuel supply to said engine is cut off; and

correcting means for correcting a value of output from said at least one HC sensor by said value of output from said at least one HC sensor stored by said memory means to obtain a corrected value of said value of output from said at least one HC sensor.

5,182,908

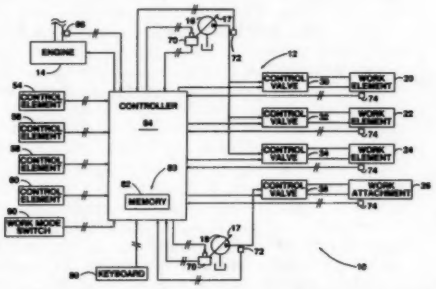
CONTROL SYSTEM FOR INTEGRATING A WORK ATTACHMENT TO A WORK VEHICLE

Lonnie J. Devier; John J. Krone, both of Dunlap; Stephen V. Lunzman, Chillicothe, and Howard A. Marsden, Pekin, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jan. 13, 1992, Ser. No. 819,705

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—420 **12 Claims**



1. An apparatus for controlling a fluid system of a work vehicle having an engine, at least one fluid circuit having a pump driven by the engine, a plurality of control valves for controllably passing fluid from the pump to a plurality of respective work elements, said control valves having movable valve stems, and a plurality of operator control elements, the apparatus comprising:

a work attachment having a respective control valve, said work attachment control valve being connected to said fluid system, said work attachment being removably attached to said work vehicle and adapted to perform a specific work function;

means for providing demand signals in response to selected settings of each respective operator control elements, each demand signal being indicative of a requested fluid flow to one of a respective work element and a respective work attachment;

memory means for storing select parameters of said fluid system, one of the select parameters being a predetermined priority value representing the order in which fluid is delivered from the pump to the control valve of said work attachment;

means for providing a plurality of work mode signals, each work mode signal representing a predetermined electrohydraulic circuit arrangement associated with the control valves of the work elements;

means for receiving the work mode signal, determining the sequence in which fluid is distributed from the pump to the control valves associated with the predetermined electrohydraulic circuit arrangement in response to receiving the work mode signal, and responsively assigning a priority value to each control valve associated with the predetermined electrohydraulic circuit arrangement;

means for receiving the predetermined priority value of said work attachment, responsively redetermining the sequence in which fluid is distributed from the pump to the control valves associated with the predetermined electrohydraulic circuit arrangement, and reassigning the priority values of the control valves associated with the predetermined electrohydraulic circuit arrangement in response to the redetermined sequence; and

means for receiving the demand signals, determining the total requested flow rates of the respective control valves in response to the demand signals, comparing the total requested flow rates of the respective control valves to the maximum flow capacity of the fluid system, calculating the valve stem displacements of the respective control valves in response to the demand signals, modifying the calculated valve stem displacements to limit the requested fluid flow to the lower priority control valves when the calculated valve stem displacement of the highest priority control valve yields less than the required fluid flow, delivering control signals to the respective control valves in response to the modified calculated valve stem displacements, and selectively positioning the stems of the respective control valves.

5,182,909

VALVE SYSTEM FOR LOAD-INDEPENDENT HYDRAULIC CONTROL OF A PLURALITY OF HYDRAULIC CONSUMERS

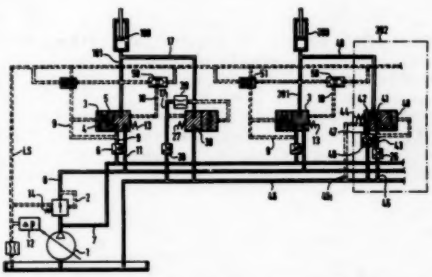
Armin Stellwagen, Lohr, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed Aug. 9, 1991, Ser. No. 743,130

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1990, 4027047

Int. Cl.[5] F15B *13/06, 11/16, 11/02*

U.S. Cl. 60—426 **17 Claims**



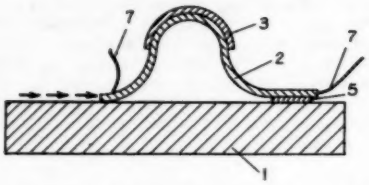
1. A valve system for controlling a plurality of simultaneously actuated hydraulic consumers or actuators, in which each consumer feed line is connected across a compensating flow control valve or compensator to be opened by displacing the spool under the action of fluid pressure downstream of a flowmeter against the opposing resistance offered by a spring and the actual maximum or highest load pressure of the consumers, said highest load pressure simultaneously being transmitted to a regulating device of a variable displacement pump which supplies the consumers wherein the compensator and the flowmeter are inserted in a secondary feed line which carries a fraction of the fluid flow feed to the consumer, said fluid flow feed being regulated by a metering edge of larger cross section and adapted to participate in the control movements of the compensator, said metering edge being supplied by valve means capable of reducing the fluid pressure in the main feed line to the pressure level downstream of the flowmeter.

5,182,910

MICROMECHANICAL MANIPULATOR

Wolfgang Benecke, Berlin, Fed. Rep. of Germany, assignor to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Fed. Rep. of Germany

Filed Jun. 7, 1991, Ser. No. 714,389
Int. Cl.[5] F03G *7/06*
U.S. Cl. 60—529 **19 Claims**



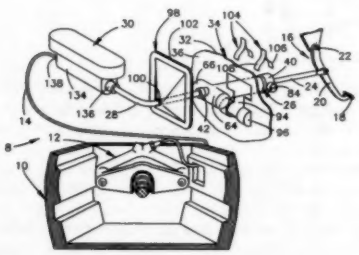
1. A micromechanical manipulator having a substrate, at least one manipulator arm composed of a plate of a first material with a first thermal expansion coefficient and a layer of a second material with a second thermal expansion coefficient which is fixedly connected to and partially covers said plate, and heating means for varying the temperature of said manipulator arm; wherein said layer has a higher expansion coefficient than said plate; wherein said manipulator arm is disposed at a small distance in parallel to said substrate and has a first end, which is fixedly connected to the surface of the substrate, and a second, free end; and wherein said layer is disposed on said plate in such a manner that the movement of said free end resulting from temperature variations is counteracted by mechanical resistance posed by said substrate surface, so that said arm bulges perpendicularly to the substrate surface when the temperature rises, whereby said free end is urged towards and executes a movement parallel to the substrate surface in the direction of said fixed end, and so that the movement runs in reverse when the temperature drops.

5,182,911

HYDRAULIC PRESSURE ACTUATING SYSTEMS WITH PIVOTABLE MOUNTING

Ronald L. Shellhause, Vandalia, Ohio, assignor to RMS Engineering, Inc., Vandalia, Ohio

Continuation-in-part of Ser. No. 649,032, Feb. 1, 1991, Pat. No. 5,133,439. This application Oct. 31, 1991, Ser. No. 785,493
Int. Cl.[5] F15B *7/00, 7/10;* **B60T** *17/22*
U.S. Cl. 60—533 **12 Claims**



1. In a hydraulic pressure actuating system having hydraulic pressure actuated means, a hydraulic fluid reservoir, a master cylinder for controllably generating and releasing hydraulic pressure for actuation and release of said hydraulic pressure actuated means, said master cylinder having a body with a bore formed therein and movable hydraulic pressure generating means received in said bore and defining with said bore hydraulic pressure generating chamber means, hydraulic fluid passage means connecting said master cylinder hydraulic pressure generating chamber means and said reservoir and said hydraulic pressure actuated means, means for actuating said master cylinder, and means mounting said reservoir and said master cylinder, the improvements comprising:

said reservoir being mounted at the highest point in said hydraulic pressure actuating system and having a housing provided with a fluid inlet and a fluid outlet to which said hydraulic fluid passage means are connected, said housing having fluid reservoir chamber means to which said fluid inlet and said fluid outlet are connected and valve control means selectively connecting said fluid reservoir chamber means to said fluid inlet and said fluid outlet and also selectively connecting said fluid inlet and said fluid outlet while closing the connection of said fluid reservoir chamber means to said fluid inlet and said fluid outlet;

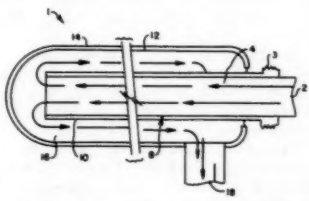
said master cylinder mounting means comprising a panel on one side of which is located said reservoir and said hydraulic pressure actuated means and on the other side of which is located said master cylinder actuating means, said master cylinder body having a curvilinear outer surface formed thereon defining one part of a pivotable force-transmitting connection, said panel having an opening therethrough and a curvilinear surface formed adjacent to said opening, said panel curvilinear surface mating with said master cylinder body curvilinear outer surface in pivotal relation so that said master cylinder body is pivotally movable in relation to said panel in at least one plane at said pivotable force-transmitting connection, said hydraulic fluid passage means connecting said master cylinder pressure generating chamber means and said reservoir extending through said opening adjacent said panel curvilinear surface, said means for actuating said master cylinder being movable in said at least one plane for actuation and release of said master cylinder with said master cylinder being pivotally moved at said mating curvilinear surfaces in said at least one plane to accommodate movements of said means for actuating said master cylinder.

5,182,912

FLUID ABSORPTION RECEIVER FOR SOLAR RADIATION

Robin Z. Parker, Miami, Fla., and Peter W. Langhoff, Bloomington, Ind., assignors to Solar Reactor Technologies, Inc., Miami, Fla.

Filed Mar. 12, 1991, Ser. No. 668,202
Int. Cl.[5] F24V *3/02*
U.S. Cl. 60—641.8 **7 Claims**



1. A fluid absorption receiver for solar radiation, comprising:

a working fluid comprising a radiant energy absorber consisting essentially of halogens, interhalogens, and a buffer gas;

a hollow, cylindrical containment for containing said working fluid having a first end, and a second end;

a hollow, cylindrical vacuum containment for insulating said cylindrical containment and admitting solar radiation having a first end, a second end, a transparent inner wall, and a transparent outer wall;

a hollow, cylindrical member, disposed within said cylindrical containment having an inner wall and an outer wall,

and defining an annular working fluid flow space comprising heat exchange means within said containment;

a hollow, cylindrical vacuum containment for insulating said cylindrical member having a first end, a second end, and a transparent outer wall; and

means for coupling said working fluid with a heat engine.

5,182,913

ENGINE SYSTEM USING REFRIGERANT FLUID

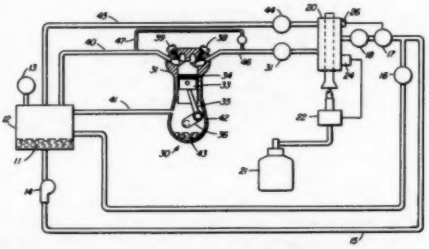
Sheldon C. Robar, R.R. #1, Greenfield, Queens County, Nova Scotia, Canada B0T 1E0 ; David W. Fraser, R.R. #3, Bridgewater, Nova Scotia, Canada B4V 2W2 , and Bernard A. Wiley, 22 Farley Place, St. Thomas, Ontario, Canada N5R 3E5

Filed Jan. 28, 1991, Ser. No. 646,183

Claims priority, application Canada, Dec. 31, 1990, 2033462

Int. Cl.[5] F01K *25/10*

U.S. Cl. 60—671 **3 Claims**



1. An engine system adapted to employ a refrigerant working fluid and comprising:

(a) a condenser for removing heat from the working fluid, the working fluid being thereby transformed from a gaseous state to a liquid state;

(b) a heating chamber;

(c) a pump for pumping the working fluid in the liquid state from the condenser to the heating chamber;

(d) a heat source for supplying heat to the heating chamber, the working fluid being thereby transformed from the liquid state to the gaseous state;

(e) a high-compression-ratio piston engine having reciprocating pistons connected to a rotatable crankshaft, the crankshaft having a series of journals each connected by a respective connecting rod to a respective one of the pistons, each piston being housed in a cylinder having a working fluid inlet valve means and a working fluid outlet valve means, the total of all of he inlet valve means controlling flow of the working fluid to the engine from the heating chamber, the total of all the outlet valve means controlling flow of the working fluid to the condenser from the engine, the rotation of the crankshaft determining the opening and closing of each of the inlet and outlet valve means, each inlet valve means being open between approximately one-quarter and approximately one-half of the downward motion of the associated piston, and each outlet valve means being open for substantially all of the upward motion of the associated piston; and

(f) a centrifugal advancement mechanism for advancing the opening and closing of each of the inlet and outlet valve means relative to the rotation of the crankshaft, the advancement mechanism comprising, firstly, a shaft connected to rotate with the crankshaft. secondly, a concentric cylinder mounted to surrond the shaft, the concentric cylinder being connected to a camshaft that determines the opening and closing of each of the inlet and outlet valves means, and thirdly, a pair of arms mounted on the concentric cylinder such that each arm extends diametrically opposite the other on the cylinder, each arm being pivotally mounted on the cylinder such that a larger end of the arm moves outwardly on the cylinder against bias with increasing rotational speed of the cylinder, a second smaller end of each arm having a portion extending generally radially inwardly into the shaft;

whereby, an increase in the rotational speed of the shaft results in a rotation of the arms which in turn result in the concentric cylinder rotating slightly relative to the shaft to advance the opening and closing of the inlet and outlet valve means relative to the rotation of the crankshaft.

5,182,914

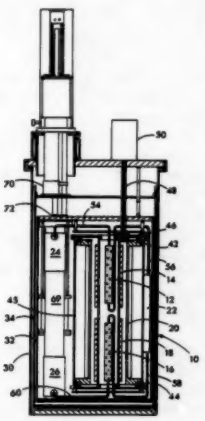
ROTARY DIPOLE ACTIVE MAGNETIC REGENERATIVE REFRIGERATOR

John A. Barclay; Joseph A. Waynert; Anthony J. DeGregoria; Joseph W. Johnson, and Peter J. Claybaker, all of Madison, Wis., assignors to Astronautics Corporation of America, Milwaukee, Wis.

Filed Mar. 14, 1990, Ser. No. 493,339

Int. Cl.[5] F25B *21/00, 9/00;* **H01F** *5/08, 7/22*

U.S. Cl. 62—3.1 **38 Claims**



1. A regenerative magnetic refrigerator comprising:

(a) a magnetic material bed that is composed of a material subject to the magnetocaloric effect;

(b) an inner dipole magnet directed along a longitudinal axis and producing a magnetic field transverse to the longitudinal axis, the magnetic material bed being positioned within the inner dipole magnet;

(c) an outer dipole magnet directed along the longitudinal axis of the inner dipole magnet and the outer dipole magnet producing a second magnetic field transverse to the longitudinal axis, the inner dipole magnet being positioned within the outer dipole magnet and the inner and outer dipole magnets being rotatable with respect to one another to produce a net magnetic field upon the magnetic material bed that represents the sum of the magnetic field of the inner dipole magnet and the magnetic field of the outer dipole magnet, the net magnetic field peaking and ebbing as the position of the inner and outer dipole magnets rotate with respect to one another;

(d) means for rotating the inner and outer dipole magnets with respect to one another on the longitudinal axis;

(e) a hot heat exchanger that is connected to the magnetic material bed to transfer heat from the magnetic material bed when the net magnetic field is peaking; and

(f) a cold heat exchanger that is connected to the magnetic material bed to transfer heat from the magnetic material bed when the net magnetic field is ebbing.

5,182,915

PORTABLE TYPE AIR CONDITIONING APPARATUS

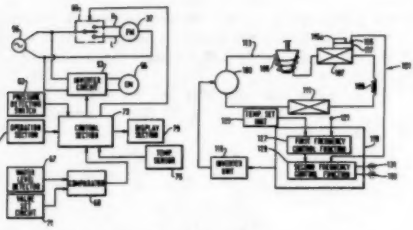
Tadasato Iida; Fusakichi Takahashi; Kouji Wada, and Toshiro Nigo, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 628,589, Dec. 17, 1990, Pat. No. 5,099,625. This application Dec. 5, 1991, Ser. No. 803,092

Claims priority, application Japan, Dec. 20, 1989, 1-328250; Dec. 21, 1989, 1-329604; Jan. 17, 1990, 2-007541

Int. Cl.[5] F25B *1/00*

U.S. Cl. 62—89 **13 Claims**



1. A portable air conditioning apparatus comprising:

means for determining an air conditioning load in a defined space to be air-conditioned;

a refrigerating circuit having high and low pressure sides of refrigerant, including,

variable capacity compressing means for compressing refrigerant, and

condenser means associated with the variable capacity compressing means for condensing the refrigerant, the condenser means being cooled by water and air, a part of the water being evaporated by the heat of the condenser means;

water supply means for supplying water to the condenser means;

refrigerant temperature detecting means for detecting the temperature of refrigerant at the high pressure side of the refrigerating circuit, the temperature of the refrigerant increasing when the water in the water supply means is exhausted; and

control means for forcibly decreasing the capacity of the variable capacity compressing means and maintaining the operation of the variable capacity compressing means irrespective of the air conditioning load when the temperature of the refrigerant at the high pressure side of the refrigerating circuit is greater than a prescribed value.

5,182,916

AUTOMATIC ICE MAKER AND HOUSEHOLD REFRIGERATOR EQUIPPED THEREWITH

Hiroshi Oike, Osaka, and Akira Kawamoto, Ibaraki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 15, 1990, Ser. No. 612,980

Claims priority, application Japan, Nov. 16, 1989, 1-299217

Int. Cl.[5] F25C *5/06*

U.S. Cl. 62—135 **6 Claims**

1. An ice maker comprising:

a) an ice making compartment;

b) an ice tray having an underside and an upper side, the ice tray being provided in the ice making compartment so as to be capable of being inverted;

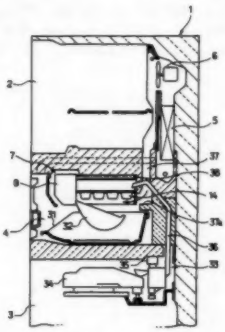
c) a drive mechanism for inverting the ice tray, thereby removing the ice from the ice tray;

d) a cover provided on the upper side of the ice tray;

e) a heater embedded in the cover for heating the upper side of the ice tray during an ice making stage;

f) water supply means for supplying the ice tray with water from a bottom surface of the ice tray to a water surface;

g) chilled air supply means, having an outlet directed to the underside of the ice tray in the ice making compartment, for supplying chilled air into the ice making compartment through the outlet so that the chilled air flows along the underside of the ice tray, the water in the ice tray being frozen first from the bottom side surface of the ice tray such that air bubbles contained in the water are caused to escape therefrom through the water surface, thereby making a transparent ice;



h) a temperature sensor including a thermistor molded in an insulating resin so that the thermistor is embedded in an upper portion of the insulating resin, the temperature sensor being disposed at an intermediate position of the height of the ice tray; and

i) control means for controlling the drive mechanism to invert the ice tray when the temperature sensed by the temperature sensor reaches an ice making completion temperature, the ice being removed from the inverted ice tray.

5,182,917

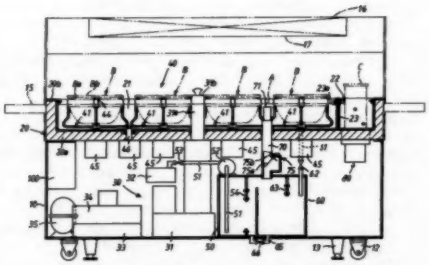
FOOD SERVICE COUNTER OF THE ICE STORAGE TYPE

Syuji Kado, Toyoake; Susumu Tatematsu, Nagoya, and Hideyuki Ikari, Kariya, both of Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan

Filed Feb. 21, 1992, Ser. No. 838,610

Int. Cl.[5] F25C *1/14, 5/018*

U.S. Cl. 62—137 **6 Claims**



1. An ice storage type food service counter comprising:

an ice storage tank arranged to store an amount of ice and having a drain hole at a bottom;

an ice supply device for automatically producing chips of ice and supplying the same into the ice storage tank;

an agitating device arranged within the ice storage tank for

agitating and leveling the chips of ice stored in the ice storage tank;

a water supply tank arranged below the ice storage tank to store an amount of ice making water for use in the ice supply device;

a discharge tank arranged below the ice storage tank to store the water of melted ice discharged from the ice storage tank through the drain hole; and

an overflow pipe having an upper end opening into the interior of the ice storage tank at a position lower than an upper edge of the ice storage tank and extending downward to discharge the chips of ice located above its upper end into either one of the water supply tank or the discharge tank.

5,182,918

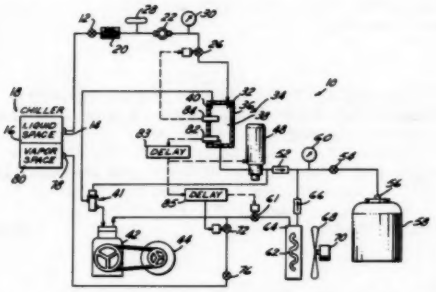
REFRIGERANT RECOVERY SYSTEM

Kenneth W. Manz, Paulding, and Christopher M. Powers, Bryan; both of Ohio, assignors to SPX Corporation, Muskegon, Mich.

Continuation-in-part of Ser. No. 799,433, Nov. 26, 1991. This application May 26, 1992, Ser. No. 887,887

Int. Cl.[5] F25B *45/00*

U.S. Cl. 62—149 **11 Claims**



1. A system for recovering refrigerant from refrigeration equipment comprising:

a refrigerant compressor having an inlet and an outlet,

refrigerant accumulator means having an inlet port, a vapor outlet port and a liquid outlet port,

input means for connecting said inlet port of said accumulator means to the refrigeration equipment from which refrigerant is to be recovered,

a liquid refrigerant pump having an inlet and an outlet,

means for connecting said liquid refrigerant pump outlet to a refrigerant storage container,

means for connecting said liquid outlet port of said accumulator means to said liquid refrigerant pump inlet such that said liquid refrigerant pump pumps liquid refrigerant from said liquid outlet port to the storage container, and

means responsive to a pressure differential between said liquid refrigerant pump and said accumulator means for operatively connecting said vapor outlet port to said compressor inlet such that operation of said compressor functions to draw refrigerant from said input means into said accumulator means while limiting pressure differential across said liquid refrigerant pump.

5,182,919

OIL RECOVERY SYSTEM FOR CLOSED TYPE CENTRIFUGAL REFRIGERATING MACHINE

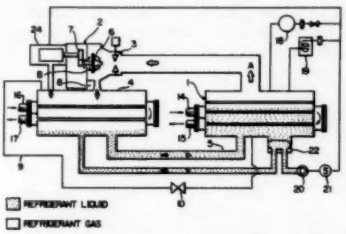
Satoru Fujiwara, Tokyo, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Jan. 15, 1991, Ser. No. 641,210

Claims priority, application Japan, Jan. 18, 1990, 2-10160; Jan. 18, 1990, 2-10161

Int. Cl.[5] F25B *31/00*

U.S. Cl. 62—193 **6 Claims**



1. In a closed type centrifugal refrigerating machine including a compressor that has an oil sump below the suction side thereof, a condenser that liquefies compressed refrigerant gas by cooling, an evaporator that evaporates the liquefied refrigerant, a suction volume control valve that controls the volumetric flow of refrigerant gas sucked into said compressor from said evaporator, recovery means for recovering oil from said oil sump to an oil tank in a lubricating system, and control means for starting or stopping said compressor in accordance with the magnitude of refrigeration load, an oil recovery system for said closed type centrifugal refrigerating machine comprising:

valve opening control means for controlling the opening of said suction volume control valve to open said control valve to a predetermined degree when the number of times of operation of said compressor per unit of time exceeds a set number, the predetermined degree being greater than a normal degree of control valve opening during operations of said compressor, such that an increase in the amount of oil recovered to said oil tank is attained.

5,182,920

REFRIGERATION CYCLE SYSTEM

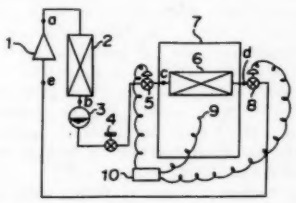
Fumio Matsuoka, Kamakura; Kouichi Negoro, Wakayama; Takeshi Sugimoto, Wakayama; Toshiaki Yamaguchi, Wakayama, and Tetsuya Yamashita, Wakayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1992, Ser. No. 903,275

Claims priority, application Japan, Jul. 15, 1991, 3-173918

Int. Cl.[5] F25B *41/04*

U.S. Cl. 62—206 **1 Claim**



1. A refrigeration cycle system comprising:

a refrigeration cycle having a compressor (1), a condenser (2), a solenoid valve (4), an electronic expansion valve (5),

an evaporator (6), and a motorized suction throttle valve (8) connected in series therein; and

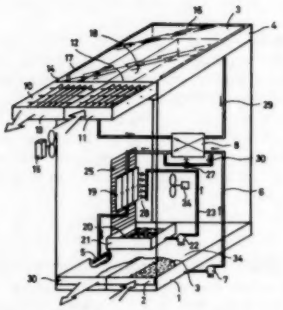
a control unit (10) which when an evaporation load is great, a variable (ΔS_{LEV}) of the setting (S_{LEV}) of the electronic expansion valve (5) is set to be in a throttling direction and a variable (ΔS_{Suc}) of the setting (ΔS_{Suc}) of the motorized suction throttle valve (8) is set to be an unthrottling direction in association with the operation of the electronic expansion valve (5), and which the evaporation load is small, the variable (ΔS_{LEV}) of the setting of the electronic expansion valve (5) is set to be in an unthrottling direction and the variable (ΔS_{Suc}) of the setting of the motorized suction throttle valve (8) is set to be in a throttling direction in association with the operation of the electronic expansion valve (5).

5,182,921

SOLAR DEHUMIDIFIER

Wen-Jyh Yan, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

Filed Apr. 10, 1992, Ser. No. 866,348
Int. Cl.[5] F25B *15/00*; F25D *23/00*
U.S. Cl. 62—235.1 **5 Claims**



1. A solar dehumidifier which comprises:

(a) a regenerator which contains liquid desiccant, wherein said regenerator further comprises a first air inlet, a first air outlet, therein moisture in said liquid desiccant being evaporated by solar radiation will be removed by the air flow entering said first air inlet and exiting from said first air outlet, and a heat-pipe heat exchanger disposed between said first air inlet and first air outlet for achieving higher rate of evaporation of said liquid desiccant;

(b) a dehumidifying bed unit which further comprises a second air inlet and a second air outlet, wherein said solar dehumidifier utilizes said regenerated liquid desiccant to absorb moisture in the humid air entering said second air inlet and exiting from said second air outlet and then circulate said liquid desiccant between said regenerator and said dehumidifying bed unit; and

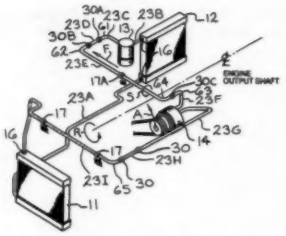
(c) a heat exchanger connected between said regenerator and said dehumidifying bed unit in order to perform heat exchange between the liquid desiccant flowing from said dehumidifying bed unit and the liquid desiccant returning from said regenerator.

5,182,922

AUTOMOTIVE AIR-CONDITIONING SYSTEM

Alan R. Allread; Dennis B. Chichester, both of Jackson; Russell L. Rogers, Munith, all of Mich., and Steven M. Knowles, Woodburn, Ind., assignors to Aeroquip Corporation, Maumee, Ohio

Division of Ser. No. 795,444, Nov. 21, 1991. This application Mar. 24, 1992, Ser. No. 856,598
Int. Cl.[5] B60H *1/32*
U.S. Cl. 62—239 **16 Claims**



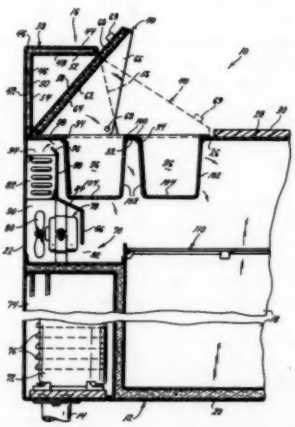
1. In an automotive vehicle refrigeration system having a condenser and an evaporator affixed to the vehicle chassis and a compressor affixed to the prime mover wherein said prime mover is affixed to said chassis by resilient support means for damping vibrations therebetween the improvement comprising fluidic connecting means between said compressor and said condenser and between said compressor and said evaporator consisting solely of lengths of rigid conduit means in at least three different planes and including at least one flexible connector means therebetween positioned in an area of high bending moment resulting from movement of said lengths relative to one another.

5,182,923

REFRIGERATOR UNIT FOR FOOD PRODUCTS

Robert J. Trulaske, Sr., Frontenac, Mo., assignor to True Food Service Equipment, Inc., O'Fallon, Mo.

Division of Ser. No. 713,635, Jun. 10, 1991, which is a continuation of Ser. No. 416,549, Oct. 3, 1989, abandoned. This application Sep. 4, 1991, Ser. No. 754,962
Int. Cl.[5] F25D *23/12*
U.S. Cl. 62—249 **5 Claims**



5. A refrigerator unit for food products, comprising:

(a) a cabinet including opposed sidewalls, a bottom wall, a

rear wall, at least one front door and a top wall, the top wall having a front portion providing a work area and a rear portion providing a pan area and having a plurality of rows of pan-receiving openings,

(b) a cover assembly for the rear portion of the top wall including:

1. a fixed ell-shaped hood having a generally vertical back wall and a generally horizontal top wall each wall including an outer portion, a flat preformed sheet insulating foam core and an inner liner, and opposed sidewalls, and

2. a movable cover having an insulated top wall including an outer portion, a flat preformed sheet, insulating foam core and an inner liner and opposed side walls, said sidewalls being operatively connected in pivotal relation to the opposed sidewalls of the hood to move said cover from a closed position cooperating with the hood to provide an insulated enclosure for the pan area extending a substantial height above the pan area, to an open position affording access to the pan area,

(c) a plurality of removable pans insertable within the pan-receiving openings, each having an upper portion, operatively carried by the rear portion of the cabinet top wall, and a depending pan portion including sidewalls and a bottom wall, said pan portion extending into the interior of the cabinet, and

(d) a forced air refrigeration system within the cabinet for cooling the interior of the cabinet and the pans, said system including a fan with the fan blade facing the rear wall of the cabinet and passage means formed from wall means spaced from the rear wall of the cabinet, said wall means including a lower portion disposed above the upper portion of the fan and an upper portion disposed above the upper portion of the fan and spaced from the cabinet top wall to define an elongate outlet opening directing cooling air onto and between the pans, the refrigerator system including an evaporator coil disposed between the cabinet rear wall and the passage means upper wall portion.

5,182,924

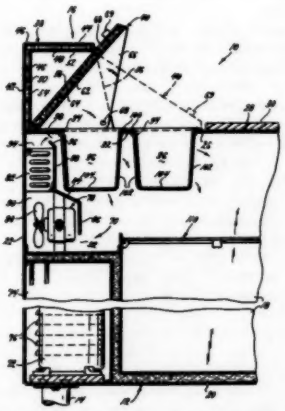
REFRIGERATOR UNIT FOR FOOD PRODUCTS

Robert J. Trulaske, Sr., Frontenac, Mo., assignor to True Food Service Equipment, Inc., O'Fallon, Mo.

Continuation of Ser. No. 713,635, Jun. 10, 1991, abandoned, which is a continuation of Ser. No. 416,549, Oct. 3, 1989, abandoned. This application Jul. 9, 1992, Ser. No. 912,025

Int. Cl.[5] F25B *49/00*; A47F *3/04*

U.S. Cl. 62—255 **6 Claims**



1. A refrigerator unit for food products comprising:

(a) a cabinet including opposed sidewalls, a bottom wall, a rear wall, at least one front door and a top wall, the top wall having a front portion providing a work area and a rear portion providing a pan area and having a plurality of pan-receiving openings,

(b) a cover assembly for the rear portion of the top wall including a fixed portion and a movable cover, said cover being operatively pivotally attached to said fixed portion to move from a closed position, providing at least part of an enclosure for the pan area, to an open position affording access to the pan area,

(c) a plurality of removable pans insertable within the pan-receiving openings, each having an upper portion operatively carried by the rear portion of the cabinet top wall and a depending lower portion including sidewalls and a bottom wall, said lower portion extending into the interior of the cabinet, and

(d) a forced air refrigeration system within the cabinet for cooling the interior of the cabinet and the pans, said system including a fan and an evaporator adjacent the cabinet rear wall, the fan being adapted to force air through the evaporator for said cooling, and passage means between the fan and the pans, the passage means adapted to confine to the evaporator air drawn in by the fan, and to direct cooled air blown from the evaporator onto and between the pans,

(e) the refrigeration system including means carrying the fan with the fan blade facing the rear wall of the cabinet and the passage means includes interior wall means spaced from the rear wall of the cabinet and including a lower portion disposed below the upper portion of the fan and an upper portion disposed above the upper portion of the fan and spaced from the cabinet top wall to define an elongate opening directing cooling air onto and between the pans, the refrigeration system including an evaporator coil disposed between the cabinet rear wall and the passage means upper wall portion,

(f) the passage means upper wall portion including an elongate lip turned inwardly of the passage means and cooperating with the cabinet top wall rear portion to direct the cooling air.

5,182,925

INTEGRALLY FORMED, MODULAR ICE CUBER HAVING A STAINLESS STEEL EVAPORATOR AND MICROCONTROLLER

Robert J. Alvarez, Denver; Scott E. Bredesen, Englewood; James J. Wilson, Westminster; Duane D. Flim, Aurora, all of Colo.; Todd E. Kniffen, Williamsburg, Iowa, and Clinton O. Schahrer, Longmont, Colo., assignors to Mile High Equipment Company, Denver, Colo.

Filed May 13, 1991, Ser. No. 701,440

Int. Cl.[5] F25C *1/12*

U.S. Cl. 62—347 **15 Claims**

13. An evaporator for freezing water into ice cubes, the evaporator being chilled by cold refrigerant from a refrigeration system, the evaporator comprising:

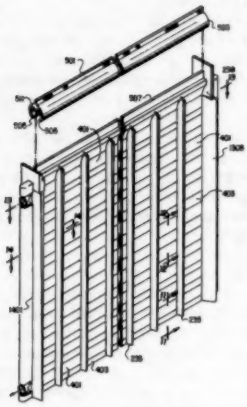
a first plate;

a second plate mated with the first plate, the second plate having a serpentine depression, displaced oppositely from the first plate, with traversing spaced-apart parallel sections connected by bend sections so as to form a continuous channel for carrying chilled refringent defined between the first plate and the depression of the second plate;

an array of icing sites on which water is frozen, each icing site disposed on an outside surface portion of the parallel sections of the depression of the second plate, over the refrigerant channel to allow for efficient transfer of heat from water flowing across the icing sites to chilled refrigerant in the channel; and

means for impeding formation of ice bridges between adjacent freezing sites, the means for impeding formation of ice bridges including laterally extending slots defined in

the second plate between adjacent parallel sections of the depression and matching slots defined in the first plate so



as to form a plurality of laterally extending openings through the evaporator inhibiting formation of ice bridges.

5,182,926

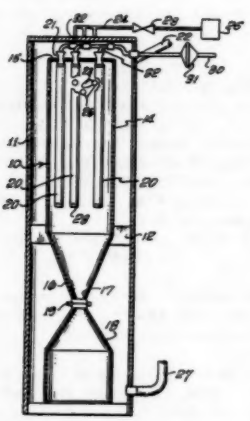
RECOVERY OF AROMA GASES

Lawrence G. Carns, Plain City, and James Tuot, Dublin, both of Ohio, assignors to Nestec S.A., Vevey, Switzerland

Filed Sep. 16, 1991, Ser. No. 760,662

Int. Cl.[5] A23F *1/08*

U.S. Cl. 62—352 **12 Claims**



1. A method of recovering aroma gas evolved during processing of a beverage which comprises

conducting the aroma gas to a cryogenic collector,

injecting liquid nitrogen into the aroma gas in said collector under conditions sufficient to condense aroma frost particles from the aroma gas and volatilize the liquid nitrogen thereby forming a suspension of aroma frost particles in nitrogen gas,

contacting the gaseous suspension with a porous filter medium having a pore size distribution which removes substantially all of the aroma frost particles from the gaseous suspension, with the particles being deposited on the filter medium and the nitrogen gas component of the suspension passing through said porous filter medium,

dislodging the aroma frost particles from the filter medium, and

recovering the condensed aroma frost particles.

5,182,927

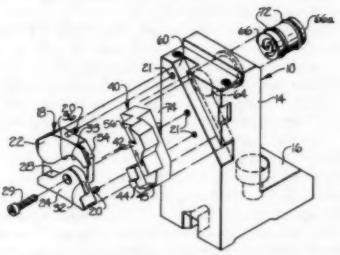
CAM SYSTEM FOR CIRCULAR KNITTING MACHINE

David Pernick, Glendale, N.Y., assignor to Monarch Knitting Machinery Corporation, Glendale, N.Y.

Continuation-in-part of Ser. No. 674,212, Mar. 25, 1991. This application Jul. 29, 1991, Ser. No. 737,383

Int. Cl.[5] D04B *9/06*

U.S. Cl. 66—54 **14 Claims**



1. A stitch cam unit for engaging the operating butts of knitting needles in circular knitting machines to raise and lower the needles, comprising:

a support body having a groove formed therein at an oblique angle;

needle raising cam means fixed to said support body such that said needle raising cam means covers a portion of said groove, said needle raising cam means including:

an upper needle raising cam member having an upwardly inclined lower butt engaging surface extending between a bottom and a top portion;

a lower needle raising cam member having an upwardly inclined upper butt engaging surface extending between a bottom and a top portion;

said upwardly inclined lower butt engaging surface of said upper needle raising cam member and said upwardly inclined upper butt engaging surface of said lower needle raising cam member being spaced apart from each other to define an upwardly inclined first portion of closed track for receiving operating butts of knitting needles;

said upper needle raising cam member also including a downwardly inclined lower butt engaging surface extending from said top portion of said upwardly inclined lower butt engaging surface;

said lower needle raising cam member also including a downwardly inclined upper butt engaging surface extending from said top portion of said upwardly inclined upper butt engaging surface;

said downwardly inclined lower butt engaging surface of said upper needle raising cam member and said downwardly inclined upper butt engaging surface of said lower needle raising cam member being spaced apart from each other to define a downwardly inclined second portion of closed track for

receiving operating butts of knitting needles; movable stitch cam means, including:

an upper stitch cam member having a lower butt engaging surface;

a lower landing stitch cam member having an upper butt engaging surface being spaced apart from said lower butt engaging surface of said upper stitch cam member to define a third portion of closed track for receiving operating butts of knitting needles; and

a tongue being slidably received within said groove in said support block, a portion of said tongue extending behind said needle raising means to slidably retain said movable stitch cam means against said support body; and

means for moving said stitch cam means obliquely relative to said fixed needle raising cam means;

said downwardly inclined lower butt engaging surface of said upper needle raising cam member including a front extension, and said downwardly inclined lower butt engaging surface of said upper stitch cam member including a notch, said front extension of said downwardly inclined lower butt engaging surface of said upper needle raising cam member and said notch of said downwardly inclined lower butt engaging surface of said upper stitch cam member cooperating with each other to provide a continual lower butt engaging surface when said stitch cam means is moved; and

said upper butt engaging surface of said lower landing stitch cam member including a front notch, and said downwardly inclined upper butt engaging surface of said lower needle raising cam member including a rear notch, said notches of said landing stitch cam member and said downwardly inclined upper butt engaging surface of said lower needle raising cam member cooperating with each other to provide a continual upper butt engaging surface when said stitch cam means is moved;

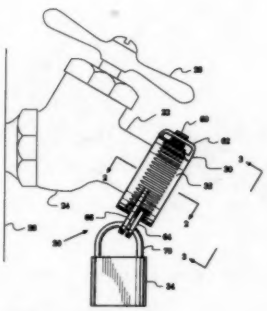
whereby said track defined by said needle raising means and said movable stitch cam means remains closed when said movable stitch cam means is moved between different positions, and further whereby the stitch forming level of the needles as defined by said closed track may be adjusted without substantially narrowing or widening said closed cam track.

5,182,928

HOSE BIBB CLOSURE

Patrick J. O'Fearna, 1453 S. Westgate, Apt. 4, Los Angeles, Calif. 90025

Filed Aug. 23, 1991, Ser. No. 749,124
Int. Cl.[5] F16B *41/00*
U.S. Cl. 70—232 **6 Claims**



1. Hose bibb closure, comprising:

a cap defining a bottom and a skirt therearound, said skirt defining internal threads to rotatably engage the hose bibb spout threads with said bottom abutting the hose bibb spout end, said skirt further defining a slot therein;

a collar having a lip to protrude inward through said slot and abut the narrowed hose bibb spout above the hose bibb spout threads;

means for coupling said collar to said cap; and

lock means for locking said coupling means;

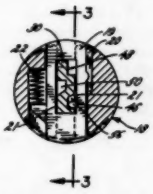
the hose bibb thereby secured against unauthorized use thereof.

5,182,929

METHOD OF PROVIDING A UNIVERSAL KEYWAY LOCK AND PLUG THEREFOR

Gary L. Myers, River Grove, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Jun. 5, 1989, Ser. No. 361,333
Int. Cl.[5] G05B *35/08*
U.S. Cl. 70—337 **5 Claims**



1. A method of adapting a cylindrical lock employing a rotatable plug with a longitudinally extending rectangular key slot for universally receiving keys having a control area and a multiplicity of different warding including the steps of

a) providing a tumbler carrying plug with a substantially unrestricted keyway slot adapted to receive properly bitted keys of each of said different ward configurations,

b) incorporating in said keyway only one longitudinal rib predeterminedly located to receive the control area of the key and to be at a common denominator location for each of the multiplicity of warded key blanks and to provide guidance and support for all of the multiplicity of keys in the plug keyway slot, and

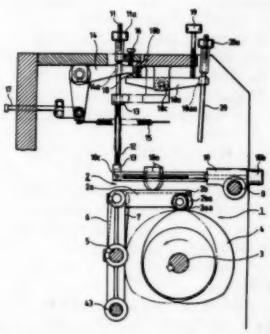
c) adapting said substantially unrestricted slot plug for replacing a lock plug having a specific keyway slot for a specially warded key configuration.

5,182,930

METHOD FOR MAKING COILED SPRINGS

Takeji Matsuoka, Tokyo, Japan, assignor to MEC Machinery Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1991, Ser. No. 673,385
Claims priority, application Japan, Mar. 30, 1990, 2-83245
Int. Cl.[5] B21F *3/10*
U.S. Cl. 72—138 **4 Claims**



1. A process for making coiled springs comprising the steps of:

intermittently rotating feed rollers with a wire held therebetween to feed the wire through a wire guide into engagement with a bending die located at an outlet of the wire guide to thereby coil the wire;

extending a pitch tool in an extending direction for pitching,

as a follower of a cam unit is moved toward a base circle of a pitch cam by the force of a spring; and

retracting the pitch tool in a retracting direction to complete the pitching, as said follower of the cam unit is moved away from the base circle of the pitch cam against the force of the spring.

5,182,931

METHOD FOR CONTINUOUS TENSION STRETCHING OF THIN STRIPS, PARTICULARLY METAL STRIPS

Oskar Noé; Rolf Noé, and Andreas Noé, all of Mülheim, Fed. Rep. of Germany, assignors to BWG Bergwerk-und Walzwerk Maschinenbau GmbH, Duisberg, Fed. Rep. of Germany

Filed Feb. 16, 1990, Ser. No. 481,983

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1989, 3912676

Int. Cl.[5] B21D *3/12*

U.S. Cl. 72—183 **2 Claims**

1. In a method for continuous tension stretching of thin metal strips of steel, aluminum and like metals having a thickness of between 0.05 mm and 0.5 mm, the method including passing the strip through a set of brake rollers and a set of pull rollers and subjecting the strip to a stretch pull operation between the two sets of rollers for stretching the strip in the plastic range, wherein the stretch pull force corresponds to or slightly exceeds the yield point of the strip material, the improvement comprising subjecting the strip to a stretch pull operation required for stretching the strip in the plastic range in a pair of tension stretching rollers arranged between the set of brake rollers and the set of pull rollers and subjecting the strip to a stretch pull operation required for stretching the strip in the elastic range in the set of brake rollers and the set of pull rollers.

5,182,932

APPARATUS FOR BENDING STEEL BARS TO FORM CONCRETE REINFORCEMENT ELEMENTS

Gerhard Ritter; Klaus Ritter, and Gerhard Schmidt, all of Graz, Austria, assignors to EVG Entwicklungs-u. Verwertungs-Gesellschaft m.b.HH, Graz, Austria

PCT No. PCT/AT90/00076, § 371 Date May 15, 1991, § 102(e) Date May 15, 1991, PCT Pub. No. WO91/04113, PCT Pub. Date Apr. 4, 1991

PCT Filed Jul. 30, 1990, Ser. No. 659,308

Claims priority, application Austria, Sep. 20, 1989, 2206/89; Feb. 8, 1990, 279/90

Int. Cl.[5] B21D *7/022, 43/20*

U.S. Cl. 72—217 **17 Claims**

1. Apparatus for bending a plurality of steel bars to form concrete reinforcement elements or stirrups,

said apparatus defining a longitudinal direction parallel to a longitudinal direction of the bars,

said apparatus having

a bar feed device;

two bending frame means (**2, 2'**), each bending frame means including bending members (**11, 12**) spaced from each other and defining a bar gap;

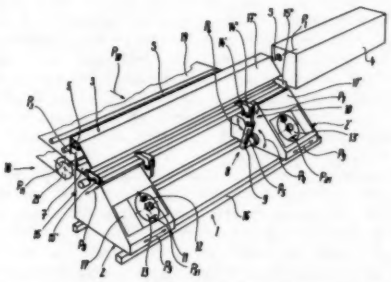
means for adjustably mounting said bending frame means for adjustment relative to each other in a longitudinal direction of the apparatus,

and comprising

a bar gripping and transfer device (**8, 8'**) coupled to each of the bending frame means (**2, 2'**),

the bar gripping and transfer devices each having gripper tongs (**10, 28**) and conjointly movable gripping jaws (**14', 14''**),

said gripper tongs being movable between a receiving position for receiving and clamping a plurality of bars between the gripping jaws (**14', 14''**), and a discharge position for placing said plurality of bars clamped in the gripping jaws in the bar gap of the bending members (**11, 12**);



a buffer and guide surface (**7**) positioned transversely with respect to the longitudinal direction of the apparatus and located in the vicinity of the receiving position of the gripper tongs (**10, 28**), said buffer and guide surface (**7**) receiving the bars from the bar feed device (**3, 4; 28**); and

a common bar alignment device (**15**) operatively associated with the buffer and guide surface (**7**) for aligning at least one of the ends of the bars with respect to a reference so that said bars can be placed within the gripper jaws (**14', 14''**) at the receiving position when in alignment.

5,182,933

METHOD OF PRODUCING DEVICES FOR INTERCONNECTING CONVEYOR OR SIMILAR BELTS

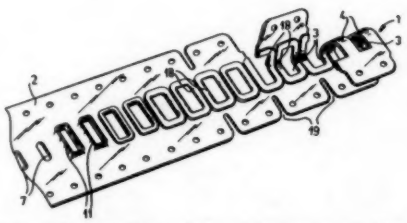
Jean-Francois Schick, Paris, France, assignor to Goro S. A., Chelles Cedex, France

Filed Sep. 10, 1991, Ser. No. 758,877

Claims priority, application France, Sep. 10, 1990, 90 11171

Int. Cl.[5] B21D *28/06*

U.S. Cl. 72—335 **7 Claims**



1. A method of making a belt end fastener, comprising the steps of:

(a) forming a row of spaced-apart apertures in a central portion of a metal strip;

(b) widening each of said apertures by pressing an edge portion of the metal strip completely surrounding each aperture transversely to said strip, thereby forming a collar all around each aperture;

(c) bending sides of each collar outwardly from the respective aperture to lie against a surface of said strip adjacent the respective aperture, thereby forming an outwardly bent frame all around each aperture; and

(d) thereafter bending said strip into a U-shape about a longitudinal axis parallel to the strip to render said surface concave and bend opposite longitudinal edges of each of

said frames inwardly, thereby forming U-shaped hinge elements separated by said apertures, interdigitatable with corresponding hinge elements of a second such strip to be joined to the first-mentioned strip by a hinge pin and reinforcing each of said elements along an interior of a respective bend by bringing two of said longitudinal edges adjacent one another of frames of succesive apertures along the strip, said longitudinal edges of said frames of each element extending over substantially a full length thereof.

5,182,934

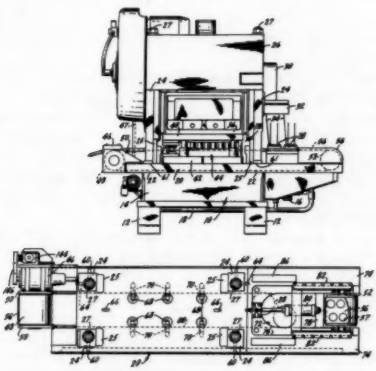
DUAL LANE CONVERSION SYSTEM

Frank J. Herdzina, Schaumburg, and Rollie M. Goodrich, Palatine, both of Ill., assignors to Service Tool Die & Mfg. Co., Elk Grove Village, Ill.

Continuation of Ser. No. 143,585, Jan. 13, 1988, abandoned. This application Jun. 12, 1990, Ser. No. 537,159

Int. Cl.[5] B21J *11/00*

U.S. Cl. 72—405 **9 Claims**



1. A press for converting work pieces into parts, comprising a bed, a bolster mounted on the bed, a plurality of columns mounted on the bolster and having a way attached to each column, main drive means mounted on the columns, a ram slidable upon the ways and driven by the main drive means to reciprocate toward and away from the bolster, upper and lower tooling means attached to the arm and bolster, respectively, having a plurality of stations for converting said work pieces into parts, conveyor drive means mounted on the bolster, and conveyor means mounted on the conveyor drive means for carrying work pieces into and through the tooling means stations, the bolster comprising a one-piece member which includes locating means engageable with the conveyor drive means, columns and lower tooling means for establishing the correct positions of the conveyor drive means, the columns and the lower tooling means with respect to one another, such that they are aligned for cooperation.

5,182,935

SINGLE RECIPROCATING DYNAMIC BALANCER FOR A DOUBLE ACTION STAMPING PRESS

Robert L. Schockman, St. Henry, Ohio, assignor to The Minster Machine Company, Minster, Ohio

Division of Ser. No. 666,255, Mar. 8, 1991, Pat. No. 5,136,875. This application May 8, 1992, Ser. No. 880,542

Int. Cl.[5] B21J *9/18*

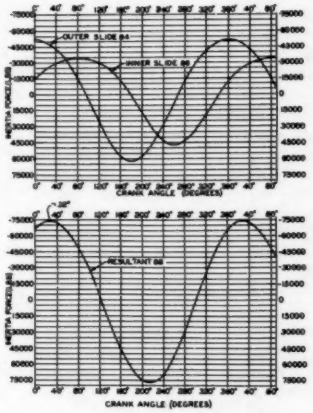
U.S. Cl. 72—417 **4 Claims**

1. A method of balancing the inertia forces of a double action press having an inner slide and an outer slide connected to a crankshaft comprising the following steps

generating a sinusoidal inertia force curve of the inner slide;

generating a sinusoidal inertia force curve of the outer slide;

adding the sinusoidal inertia force curve of the inner slide and the sinusoidal inertia force curve of the outer slide to obtain a resultant inertia force curve; and



providing in the press a dynamic balancer having a single mass driven by the crankshaft in a sinusoidal motion, said single mass having an inertia force curve substantially opposite and substantially equal to the resultant inertia force curve.

5,182,936

PLATE BENDING MACHINE EQUIPPED WITH A PLATE CLAMPING MANIPULATOR AND A PLATE POSITION DETECTING DEVICE

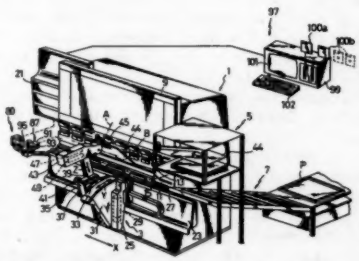
Franco Sartorio, Turin, Italy, assignors to Amada Company, Limited, Japan

Continuation of Ser. No. 489,875, Mar. 6, 1990, Pat. No. 5,058,406, which is a continuation of Ser. No. 302,668, Jan. 27, 1989, abandoned. This application Jul. 16, 1991, Ser. No. 731,005

Claims priority, application Italy, Jan. 29, 1988, 67058 A/88; Jan. 29, 1988, 67059 A/88

Int. Cl.[5] B21D *43/11;* **B21J** *13/12*

U.S. Cl. 72—420 **3 Claims**



1. A method of bending a sheet workpiece having a long edge and a short edge by means of a press brake which includes:

a pair of dies having a longitudinal axis and being capable of acting in mutual cooperation to bend a workpiece having edges;

a manipulator for handling the workpiece;

detector means, mounted on a frame of the press brake, for detecting the workpiece position along the longitudinal axis of the dies; the method comprising the steps of:

(a) bending the short edge of the workpiece between the pair of dies;

(b) rotating the workpiece by means of the manipulator so that the long edge of the workpiece faces the dies;

(c) moving the workpiece by means of the manipulator toward the detector means;

(d) detecting the workpiece position along the longitudinal axis of the dies by means of the detector means;

(e) moving the workpiece by means of the manipulator along the longitudinal axis of the dies;

(f) detecting a distance moved by the manipulator;

(g) positioning the workpiece at a suitable position with respect to the dies along the longitudinal axis of the dies, based on the workpiece position detected at the step (d) and the distance moved by the manipulator detected at the step (f); and

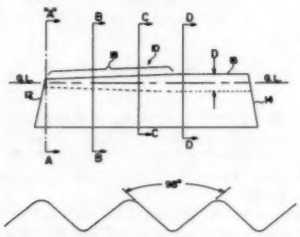
(h) bending the long edge of the workpiece between the pair of dies.

5,182,937

SEAM-FREE THREAD ROLLING DIES

Joseph F. Dickson, Jefferson, Mass., assignor to Quamco, Inc., Holden, Mass.

Filed Sep. 17, 1991, Ser. No. 761,413
Int. Cl.[5] B21H *3/06*
U.S. Cl. 72—469 **8 Claims**



1. In a die for use in the formation of a helical thread in a metal blank, the die being provided with at least a first thread forming groove in a face thereof which contacts the blank, the groove having a base region and a pair of oppositely facing side walls, the side walls extending from the groove base region to the said face of the die, an improved thread profile defining groove geometry comprising:

a dwell portion wherein the depth of the groove is substantially constant, said dwell portion terminating at the discharge end of the groove, the side walls of the groove diverging from the base region within said dwell portion at a constant average acute angle which is commensurate with the finish configuration of the thread to be formed; and

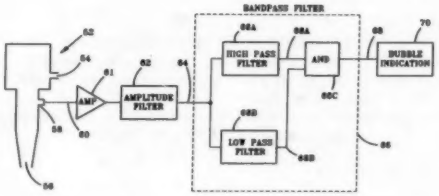
a second portion which extends from the starting end of the groove to said dwell portion, the depth of the groove increasing progressively and smoothly between said starting end and said dwell portion, said side walls having an angle of divergence at said starting end which is greater than said acute angle of divergence in said dwell portion, the shape of said side walls undergoing a smooth transition from said starting end to said dwell portion as the depth of the groove increases, said transition beginning at the base region of the groove and progressing outwardly toward the face of the die whereby said side walls have a double form in that portion of the length thereof disposed between said groove starting end and said dwell portion.

5,182,938

METHOD AND APPARATUS FOR DETECTING BUBBLES IN PRESSURIZED LIQUID DISPENSING SYSTEMS

Stephen L. Merkel, Bay Village, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Filed Feb. 22, 1991, Ser. No. 659,842
Int. Cl.[5] G01N *7/00*
U.S. Cl. 73—19.05 **19 Claims**



1. An apparatus for detecting bubbles in pressurized liquid dispensing systems comprising:

a means for detecting pressure transients of the pressurized liquid;

a means for filtering out pressure transients having amplitudes less than predetermined reference levels

a bandpass filter means for filtering out pressure transients having a period of less than a first predetermined value and also those having a period greater than a second predetermined value, wherein non-bubble related pressure transients are filtered out, and generating a signal in response thereto; and

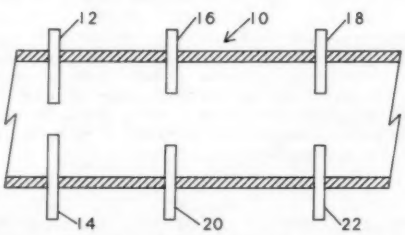
a bubble indication means, responsive to the signals received from the bandpass filter means, for indicating the occurrence of a bubble.

5,182,939

METHOD FOR DETERMINATION OF AVERAGE DOWNHOLE STEAM QUALITY BY MEASURING THE SLIP RATIO BETWEEN THE VAPOR AND LIQUID PHASES OF STEAM

Sze-Foo Chien, Houston, Tex., and Eugene F. Traverse, Denver, Colo., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 1, 1991, Ser. No. 678,092
Int. Cl.[5] G01N *31/22*
U.S. Cl. 73—29.01 **4 Claims**



1. A method for determining the quality of two phase steam in flowing steam, said method comprising the steps of:

providing means for injecting at least two tracer materials into a steam pipe;

providing at least two pairs of spaced detecting stations in said pipe, each said pair of spaced stations being adapted to detect a specific one of said tracer materials, and said stations of each pair being spaced apart a known distance;

injecting first and second tracer materials into said steam,

each said tracer material having an affinity for a respective one of said steam phases;

detecting the presence of each said tracer material as the tracer laden steam passes the respective pairs of detecting stations to determine the transit time of said tracers between the stations and the velocity of each of the two phases of the steam; and

determining steam quality from the relationship of the differences between the transit time for each phase.

5,182,940

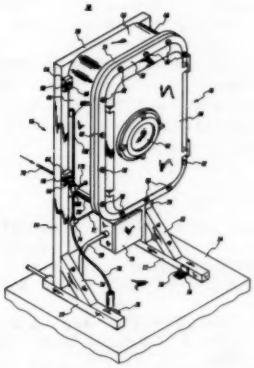
FLASH POINT TESTING APPARATUS AND METHOD

Kenneth M. Bailey, Heath; Rex L. Mitchener, Dallas; Timothy J. Wehking, Garland, and Craig P. Reith, Seabrook, all of Tex., assignors to Automated Pipeline Instruments Incorporated, Heath, Tex.

Filed Oct. 17, 1991, Ser. No. 778,006

Int. Cl.[5] G01N *25/52*

U.S. Cl. 73—36 **18 Claims**



1. Apparatus for determining flash point temperature of a liquid petroleum product being transported in a pipeline, said apparatus comprising, in combination:

first chamber means for storing a sample of the product;

product supply means communicating between the pipeline and said first chamber means for supplying the sample;

air supply means for introducing air into the sample such that a mixture of the air and vapor from the sample is present in said first chamber means;

second chamber means in fluid communication with said first chamber means;

suction means for drawing said mixture from said first chamber means into said second chamber means, said second chamber means including measuring means for measuring Lower Explosive Limit of said mixture;

temperature sensing means for measuring temperature of the sample;

density measuring means for measuring density of the sample relative to a predetermined reference; and

processing means responsive to the measured Lower Explosive Limit of said mixture and to the measured temperature and density of the sample for determining the flash point temperature of the sample.

5,182,941

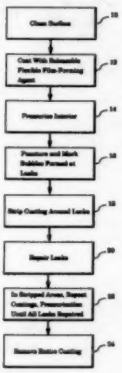
METHOD OF LEAK DETECTION USING A RELEASABLE SURFACE FILM

Jeffry T. Frenkel, San Diego, and Brent C. Anderson, Carlsbad, both of Calif., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Jan. 30, 1992, Ser. No. 828,047

Int. Cl.[5] G01M *3/12*

U.S. Cl. 73—40 **13 Claims**



1. The method of detecting leaks through a surface which comprises the steps of:

coating a clean first surface of a structure capable of being pressurized to be tested with a thin coating of a releasable flexible film forming material;

curing said coating to a flexible film;

applying a fluid under pressure to the opposite, second, surface of said structure;

observing the formation of bubbles in said film indicative of fluid leaking through said structure to said first surface;

puncturing said bubbles; and

marking said film at the location of said bubbles after puncturing said bubbles.

5,182,942

PROCESS AND APPARATUS FOR UTILIZATION OF FUELS WITH ALCOHOL ADDITIVES FOR AN INTERNAL COMBUSTION ENGINE

Gunter Hartel, Neuss; Armin Schurfeld, Meerbush; Karl-Heinrich Losing, Alpen; Dieter Thonnesen, Viersen, and Ulrich Remde, Meerbush, all of Fed. Rep. of Germany, assignors to Pierburg GmbH, Neuss, Fed. Rep. of Germany

Filed Oct. 1, 1991, Ser. No. 770,997

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1990, 4031008

Int. Cl.[5] G01N *25/02*; F02D *41/00*

U.S. Cl. 73—61.46 **25 Claims**

1. A process for detecting the concentration and type of alcohol in a fuel-alcohol fuel mixture, said process comprising

heating a sample of a fuel mixture of fuel and alcohol to a temperature above the boiling point of the alcohol in said sample,

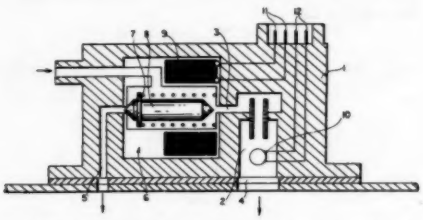
measuring the temperature of said sample of fuel mixture during the heating of said fuel mixture,

continuously correlating the measured temperature with respect to time to provide a measurement of temperature gradient with respect to time of the heated fuel mixture,

detecting from said temperature gradient of said sample any interruption of increase of temperature during said heating,

measuring the time interval during which temperature increase is interrupted, and

determining the type of alcohol present in said fuel mixture and its concentration, from the value of the temperature at



which the interruption of temperature increase takes place and the magnitude of the interval of time during which the temperature increase is interrupted.

5,182,943

CYLINDER IDENTIFICATION APPARATUS

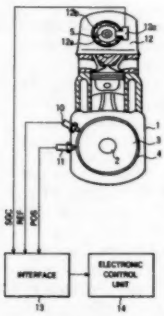
Wataru Fukui; Toshio Iwata; Yutaka Ohashi, and Masayuki Ikeuchi, all of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 616,493

Claims priority, application Japan, Nov. 24, 1989, 1-305906; Nov. 29, 1989, 1-311265; Nov. 29, 1989, 1-311266; Nov. 29, 1989, 1-311267; Nov. 29, 1989, 1-311268

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—116 **26 Claims**



1. A cylinder identification apparatus for a multi-cylinder internal combustion engine, comprising:

reference signal generating means for sensing the rotation of a crankshaft of the engine and generating a reference signal including at least one pulse indicating each time the crankshaft is at a prescribed rotational angle, wherein the number of the pulses of the reference signal per revolution of the crankshaft is proportional to the number of cylinders in the engine;

an identification signal generator for sensing the rotation of a member coupled to and rotating at ½ the speed of the crankshaft and generating a cylinder identification signal having a different form for different cylinders of the engine; and

control means for identifying each cylinder of the engine based on the cylinder identification signal and for generating engine control signals for the cylinders identified in accordance with the reference signal.

5,182,944

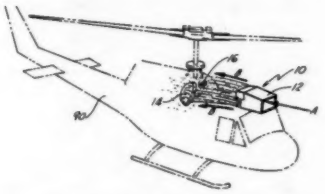
HELICOPTER ICING SPRAY SYSTEM

Siegfried W. Brunnenkant, 20408 Lucrino, New Orleans, La. 70129

Filed Jan. 18, 1991, Ser. No. 642,878

Int. Cl.[5] G01M *15/00*

U.S. Cl. 73—117.1 **15 Claims**



1. A system for testing the icing condition of aircraft engines during flight, said system being self-contained on said aircraft and comprising:

(a) a source of air under pressure bled off from said engine;

(b) a source of liquid under pressure; and,

(c) means mounted externally to said aircraft and forward of its said engine and engine air inlet and connected to said sources of air and liquid for spraying a mixture of said air and liquid toward said engine air inlet, said means for spraying comprising:

(i) an adjustable outer housing having a passageway therethrough for directing ambient air flow therethrough and toward said engine air inlet;

(ii) a distribution means positioned in said housing, said distribution means being in fluid communication with said sources of air and liquid; and,

(iii) a plurality of spray nozzles provided in said distribution means.

5,182,945

METHOD AND ARRANGEMENT FOR CHECKING THE CONTROLLABILITY OF A TANK VENTING VALVE

Siegfried Setter, Leonberg-Ezach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

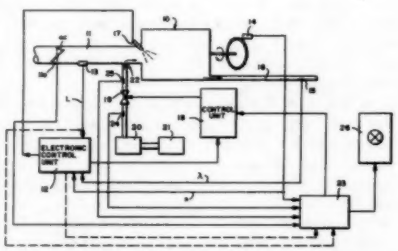
PCT No. PCT/DE90/00134, § 371 Date Sep. 25, 1991, § 102(e) Date Sep. 25, 1991, PCT Pub. No. WO90/11443, PCT Pub. Date Oct. 4, 1990

PCT Filed Feb. 27, 1990, Ser. No. 762,000

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1989, 3909887

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—118.1 **10 Claims**



1. A diagnostic method for checking the controllability of a tank venting valve through which an additional quantity of air charged with fuel vapor is passed to the intake of an internal combustion engine, the tank venting valve having a control

chain and an input line and an output line, the method comprising the steps of:

using as measuring signals the output signals of at least one sensor which detects quantities measurable in the inlet and/or outlet line of the tank venting valve with said quantities changing when the additional quantity of air passes through the valve;

when a pregiven activating signal AS is applied to the control chain of the tank venting valve, concluding in dependence upon at least one of said measuring signals that the tank venting valve is controllable and/or that the inlet line and/or outlet line is seal-tight; and,

checking to determine if the pressure pA present in the intake of the engine is below a maximum permissible value and if yes, then conducting an evaluation of the measuring signal and if said pressure pA is above said maximum permissible value, then omitting the evaluation of said measuring signal.

5,182,946

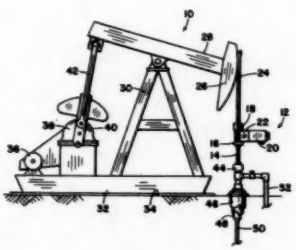
PORTABLE WELL ANALYZER

Murphy D. Boughner, Nowata; Paul J. Padilla, Tulsa, and Floyd A. Bowling, Broken Arrow, all of Okla., assignors to Amerada Hess Corporation, Tulsa, Okla.

Filed Nov. 8, 1991, Ser. No. 789,288

Int. Cl.[5] E21B *47/00*; G06F *15/00*

U.S. Cl. 73—151 **26 Claims**



1. For use with a well pumping unit having a polished rod with a string of sucker rods extending downwardly therefrom to a downhole pump that is reciprocated by the vertical reciprocal action of the polished rod to lift pumped fluid to the earth's surface, a self contained integrated system for collecting data indicative of the well pumping conditions, comprising:

a load sensing member mounted on and reciprocated with the polished rod for detecting the instantaneous weight supported by the polished rod;

a first circuit supported by and reciprocated with the polished rod and connected to said load sensing member for providing a first signal indicative of the instantaneous weight supported by the polished rod;

an accelerometer supported by and reciprocated with the polished rod;

a second circuit supported by and reciprocated with the polished rod and connected to said accelerometer providing a second signal indicative of the instantaneous displacement of the polished rod;

a data writer supported by and reciprocated with the polished rod and being connected to receive said first and second signals;

a housing mounted on and reciprocated with the polished rod and containing said load sensing member, said accelerometer, said first circuit, said second circuit and said data writer, the housing being adapted to removably receive a recorder;

a recorder removably insertable in said housing irrespective of whether said polished rod is stationary or is being reciprocated as the well is pumped to connect with said data writer to thereby receive thereon said first and second signals whereby the recorder may, after being removed from said housing, be employed to determine the well pumping conditions; and

a battery within said housing providing power for said load sensing member, said accelerometer, said first and second circuits and said data writer.

5,182,947

ELECTRIC MEASURING ARRANGEMENT FOR DETERMINING THE LEVEL OF AN ELECTRICALLY CONDUCTIVE LIQUID

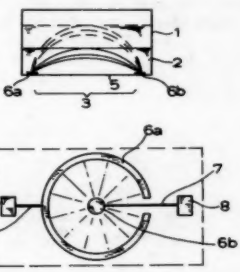
Michael Fidelak, Bönen, and Marlies Bartsch, Iserlohn, both of Fed. Rep. of Germany, assignors to HL Planartechnik GmbH, Dortmund, Fed. Rep. of Germany

Filed Mar. 6, 1991, Ser. No. 664,982

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1990, 4007232; Sep. 10, 1990, 4028730; Oct. 8, 1990, 4031845; Nov. 14, 1990, 4036262

Int. Cl.[5] G01F *23/26*

U.S. Cl. 73—304 C **30 Claims**



1. Electric measuring arrangement for determining liquid level and other physical data relating to an electrically conductive liquid located in a container, comprising at least one measuring sensor and an evaluation circuit; wherein the at least one measuring sensor is a stray field conductivity sensor with two measuring electrodes spaced at a specific lateral distance from one another, said electrodes producing an electromagnetic stray field within the electrically conductive liquid, the electrodes being disposed within the container in direct electrical contact with the electrically conductive liquid in the container wherein the container together with the electrically conductive liquid in it form a part of the measuring arrangement; and wherein the evaluation circuit comprises means for determining physical characteristics pertaining to the electrically conductive liquid from the volume of liquid measured over the measuring sensor, a known value of the conductivity of the electrically conductive liquid and said specific lateral distance.

5,182,948

ADJUSTABLE MEASURING CONTAINER

E. Stanley Robbins, Killen; Rodney W. Robbins, Florence, both of Ala.; Darrel J. Watt, Marietta, and Wendell G. Wilson, Atlanta, both of Ga., assignors to Robbins Industries, Inc., Florence, Ala.

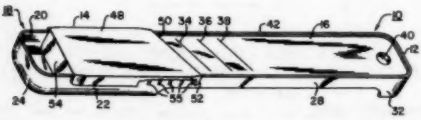
Filed Aug. 5, 1991, Ser. No. 740,153

Int. Cl.[5] G01F *19/00*

U.S. Cl. 73—429 **12 Claims**

1. A measuring container device, said device comprising, in combination, a body member having side walls, a bowl adjacent one end, said bowl having a forward end wall and a rear end wall, a sliding dam structure slidably mounted on said body member, said dam structure comprising a dam element extending into said bowl and being shaped to fit the contours of said bowl and form a dam to limit the effective volume of said bowl at each of a plurality of different locations in said bowl, and a cover member extending from said dam member by a

distance sufficient to cover the rear portion of said bowl when said dam member is moved away from said rear end wall, said cover member having edges shaped to engage said side walls of



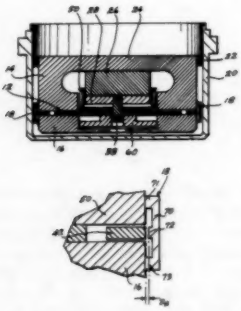
said body member to hold said cover on and allow it to slide thereon, said cover member being flexible to enable it to be easily snapped off of said body member.

5,182,949

ACCELEROMETER WITH SUPPORT CAGING

Charles J. Rupnick; Damon R. Stoddard, both of Seattle, and David B. Grindeland, Bellevue, all of Wash., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 17, 1991, Ser. No. 702,271
Int. Cl.[5] G01P *15/08*
U.S. Cl. 73—517 B **12 Claims**



1. An accelerometer for measuring acceleration along a sensing axis, the accelerometer comprising:

means for mounting a proof mass assembly;

a proof mass assembly comprising a paddle, a support, and suspension means for suspending the paddle from the support such that the paddle can move along the sensing axis in response to acceleration along the sensing axis, the support comprising an unclamped portion to which the suspension means is attached and a clamped portion mounted to said mounting means; and

restraining means separate from the clamped portion and spaced from said unclamped portion by a predetermined distance for limiting the travel of the unclamped portion in a direction normal to the sensing axis to a range selected to prevent damage to the proof mass assembly in the event of a shock being applied to the accelerometer.

5,182,950

TENSION TYPE DYNAMIC VISCOELASTICITY MEASURING APPARATUS

Haruo Takeda, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan

Filed Oct. 28, 1991, Ser. No. 783,047
Claims priority, application Japan, Oct. 29, 1990, 2-291052
Int. Cl.[5] G01N *3/38*
U.S. Cl. 73—811 **2 Claims**

1. A tension type dynamic viscoelasticity measuring apparatus for measuring viscoelasticity of a specimen which has two opposed ends, said apparatus comprising:

a specimen holder for securely holding one end of the specimen;

a specimen chuck for securely holding the other end of the specimen;

a detection rod having two opposed ends, one of which ends is connected to said specimen chuck;

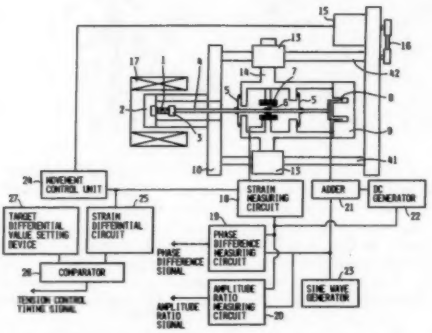
a strain detector operatively associated with said detection rod for detecting changes in position of said detection rod and producing an output signal representing the position of said detection rod relative to a reference position;

an electromagnetic force generator connected at one end of said detection rod to transmit a force to the specimen via said detection rod and said specimen chuck in response to a force signal;

a drive mechanism connected for moving said electromagnetic force generator in response to a movement signal;

electrical means for generating a force signal and for applying the force signal to said electromagnetic force generator;

movement control means for producing a movement signal and applying the movement signal to said drive mechanism for controlling the amount of movement of said drive mechanism;



signal differentiation means connected for receiving said output signal from said strain detector and producing a differential signal having a value corresponding to the time differential of said output signal from said strain detector;

a target differential value setter for providing a signal having a value corresponding to a selected value of the differential signal; and

a comparator connected to receive the differential signal and the signal provided by said target differential value setter when the effective tension in the specimen continues to change for the duration of a relaxation phenomenon that has occurred as a result of the drive mechanism being moved or the electromagnetic force of the electromagnetic force generator being changed in order to control the tension at the specimen to maintain that tension substantially at a control target value;

whereby when the value of the differential signal from said strain differentiation circuit falls below the selected value, said comparator outputs a tension control timing signal indicating that the relaxation phenomenon has ceased.

5,182,951

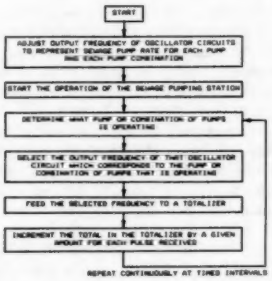
METHOD AND APARATUS FOR CALCULATING FLOW RATES THROUGH A PUMPING STATION

Johannes N. Jorritsma, 37 Yonge St. N.,, Aurora, Ontario, Canada L4G 1N6

Continuation-in-part of Ser. No. 313,458, Feb. 22, 1989, abandoned, which is a division of Ser. No. 148,875, Jan. 27, 1988, Pat. No. 4,821,580. This application Oct. 4, 1990, Ser. No. 593,644

Int. Cl.[5] G01F *1/00*

U.S. Cl. 73—861 **6 Claims**


START
ADJUST OUTPUT FREQUENCY OF OSCILLATOR CIRCUITS TO REPRESENT SEWAGE PUMP RATE FOR EACH PUMP AND EACH PUMP COMBINATION
START THE OPERATION OF THE SEWAGE PUMPING STATION
DETERMINE WHAT PUMP OR COMBINATION OF PUMPS IS OPERATING
SELECT THE OUTPUT FREQUENCY OF THAT OSCILLATOR CIRCUIT WHICH CORRESPONDS TO THE PUMP OR COMBINATION OF PUMPS THAT IS OPERATING
FEED THE SELECTED FREQUENCY TO A TOTALIZER
INCREMENT THE TOTAL IN THE TOTALIZER BY A GIVEN AMOUNT FOR EACH PULSE RECEIVED
REPEAT CONTINUOUSLY AT TIMED INTERVALS

1. A method of calculating the flow rate through a sewage handling system pumping station having at least one sewage pump, comprising the steps:

a) for each sewage pump and for each combination of sewage pumps, providing a stand-alone oscillator circuit of which the output frequency may be manually adjusted, each circuit frequency being adjustable independent of its corresponding sewage pump or combination of sewage pumps,

b) prior to operating said pumping station, adjusting the output frequency of each oscillator circuit to represent the pump rate for the sewage pump or combination of sewage pumps to which that oscillator circuit corresponds,

c) while operating the said pumping station, feeding to a totalizing device the output frequency of that oscillator circuit which corresponds to the sewage pump or combination of sewage pumps which is operating at any given time, and

d) incrementing the total in said totalizing device by a given amount for each pulse encountered, whereby the totalizing device is continuously updated.

5,182,952

PADDLEWHEEL FLOWMETER ASSEMBLY

Thomas E. Pyzik, Naugatuck, Conn., assignor to Omega Engineering, Inc., Stamford, Conn.

Filed Jan. 17, 1991, Ser. No. 642,529

Int. Cl.[5] G01F *15/18*

U.S. Cl. 73—861.79 **8 Claims**

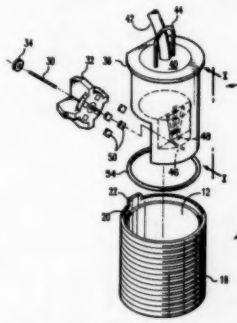
1. A linearly positionable and axially alignable sensor assembly, for separable attachment to a threaded cylindrical fitting which opens into a fluid conduit at an angle to the longitudinal axis thereof, said sensor assembly comprising:

a cylindrical housing having a cylindrical axial opening therethrough, and a threaded cylindrical surface thereon for threaded coupling with said threaded cylindrical fitting, such that said housing may be rotated so as to be advanced axially along a substantially linear path, into a desired linear position relative to the axis of the fluid conduit within said cylindrical fitting;

visible marker means on said housing alignable relative to the axis of the fluid conduit by rotation of said housing when said housing is threadedly engaged with said fitting;

said housing having an annular seating shoulder thereon for engaging and supporting a mating shoulder of a sensing unit, such that said seating shoulder may be positioned at a desired linear distance from the axis of the fluid conduit in said fitting, by threaded rotation of said housing within said fitting;

a sensing unit insertable into said cylindrical housing, and having an annular mating shoulder for engaging and seating against the seating shoulder of said cylindrical housing in any desired radial alignment position relative to said housing, when said sensing unit is inserted therein;



visible alignment means on said sensing unit alignable with said visible marker means on said housing to assure proper alignment of said sensing unit with the fluid conduit as indicated by the marker means;

fastening means engageable with said housing and said sensing unit for urging the mating shoulder of said sensing unit into engagement with the seating shoulder of said housing, to retain said unit within said housing in a desired radial alignment therewith and at a desired radial distance from the axis of the fluid conduit within said cylindrical fitting.

5,182,953

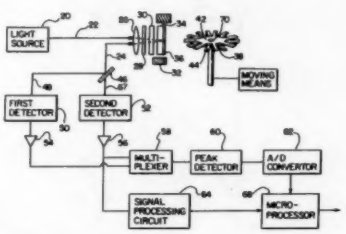
METHOD AND APPARATUS FOR SHAFT TORQUE MEASUREMENT WITH TEMPERATURE COMPENSATION

Sylvester M. Ellinger; William B. Spillman, Jr., both of Charlotte, and Douglas R. Patriquin, Middlebury, all of Vt., assignors to Simmonds Precision Products, Inc., Akron, Ohio

Filed Jul. 13, 1990, Ser. No. 552,107

Int. Cl.[5] G01L *3/02*

U.S. Cl. 73—862.335 **37 Claims**



1. A system for measuring torque applied to a rotating shaft, said system comprising:

means, responsive to rotation of the shaft, for providing an output signal, said signal having a first component related to temperature and a second component related to twisting of the shaft; and

means for processing said first and second components of said output signal for providing a signal representing the torque applied to the shaft that is compensated for temperature related change in Young's Modulus of the shaft.

5,182,954

INNER TUBE ELEMENT FOR USE IN A DEVICE FOR TAKING SOIL SAMPLES, AND METHOD FOR MANUFACTURING SUCH AN INNER TUBE ELEMENT

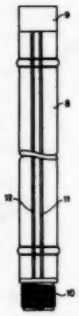
Johannes C. J. Menheere, Dalfsen, Netherlands, assignor to Wavin B.V., Netherlands

Filed Apr. 12, 1991, Ser. No. 699,313

Claims priority, application Netherlands, Apr. 27, 1990, 9001025

Int. Cl.[5] E21B *49/02*

U.S. Cl. 73—864.45 5 Claims



1. Inner tube element for use in a double tube device for taking soil samples during drilling operations, comprising differing end parts for coupling with several identical inner tube elements connected by a tube member made of plastic which is reinforced with fibers, in which the tube member has an orientation marking extending over its entire length and at least covered by a thin layer of plastic, said marking formed as a part of said tube member.

5,182,955

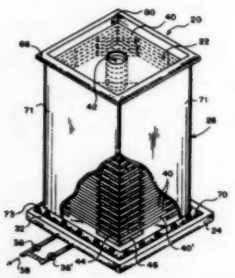
BOREHOLE FORMATION MODEL FOR TESTING NUCLEAR LOGGING INSTRUMENTS

Daniel C. Minette, Madison, Conn., assignor to Western Atlas International, Inc., Houston, Tex.

Filed Jun. 26, 1990, Ser. No. 545,305

Int. Cl.[5] G12B *13/00*

U.S. Cl. 73—865.6 9 Claims



1. A flushable simulated laboratory formation having constant known matrix properties and a preselected porosity for testing nuclear well logging instruments, comprising:

a base,

a plurality of spacer members each having a preselected thickness directly related to a preselected porosity value,

a plurality of glass sheets each having a preselected thickness and known matrix properties and having a central circular hole disposed therein for cooperating with said plurality of spacer members to form a vertical laminated stacked glass assembly comprising alternate glass sheets and uniform alternate spaces therebetween with the central circular holes of said glass sheets vertically aligned, wherein said preselected width of said spaces between said glass sheets when compared to the thickness of said glass sheets yields a simulated rock formation having known matrix properties and a known selected porosity value,

a container member open at both ends and adapted for vertical placement over said stacked glass assembly and mounting one open end to said base, the other open end of said container member extending vertically above the top of said stacked glass assembly,

means for mounting said one open end of said container member in a fluid-tight seal with said base,

a cylindrical sleeve section radially sized for vertical insertion into the openings of said vertically aligned circular holes in said plurality of glass sheets for simulating the borehole in an earth formation and sized to accept a nuclear logging instrument axially therein,

sealing means mounted on said base and cooperating with the lower end of said cylindrical sleeve for effecting a seal between said sleeve and said base for isolating the volume of said sleeve interior from the volume of the interior of said container member including said stacked glass assembly,

a first selected fluid for introduction into said sleeve cylinder for simulating the fluid present in a borehole, and

a second selected fluid for introduction into said container member exterior of said cylindrical sleeve for filling the container member and the spaces between each of said glass sheets in said stacked glass assembly for simulating the fluid present in a simulated rock matrix formation surrounding a borehole.

5,182,956

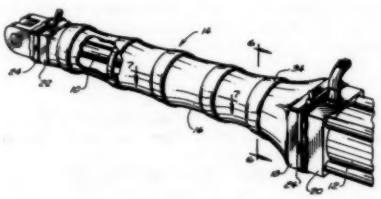
PROTECTIVE BOOT

Bobbie L. Woodall, 2513 S. Mollera, Mesa, Ariz. 85202; Charles R. Nichols, and Thelma E. Nichols, both of P.O. Box 1121, St. Johns, Ariz. 85936

Continuation of Ser. No. 414,774, Sep. 25, 1989. This application Jul. 31, 1991, Ser. No. 738,795

Int. Cl.[5] F16J *15/50*

U.S. Cl. 74—18.2 14 Claims



1. A protective boot for use with equipment including:

a guiding member having a distal end, and

a guided member arranged for reciprocation within said guiding member, said guided member including a distal end and being movable from a retracted position in which the distal end of said guided member is proximate the distal end of said guiding member to an extended position is spaced a maximum distance away from said distal end for said guiding member,

said protective boot comprising:

a flexible sleeve formed of contaminant-impervious material, said sleeve being substantially cylindrical and generally smooth when undistorted and including a first end and a second end;

first attachment means for securing the first end of said sleeve to the distal end of said guiding member;

second attachment means for securing the second end of said sleeve to the distal end of said guided member; and

at least one flexible stay secured to said sleeve intermediate said first and second ends of said sleeve for preventing intermediate portions of said sleeve from contacting said guided member.

5,182,957

DRIVE UNIT, IN PARTICULAR FOR A WINDSHIELD WIPER SYSTEM ON A MOTOR VEHICLE

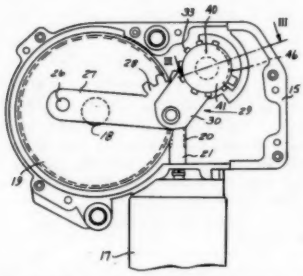
Rainer Bohmer, Brackenheim-Meimsheim; Rainer Bruhn, Karlsruhe; Hans-Peter Rienhardt, Neckarsulm, and Bernd Walther, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Fed. Rep. of Germany

Filed Mar. 18, 1991, Ser. No. 659,319

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1989, 3920731

Int. Cl.[5] F16H *21/40*; G05G *5/04*; B60S *1/08*

U.S. Cl. 74—42 **19 Claims**



1. A drive unit for a windshield wiper system on a motor vehicle comprising:

a drive motor;

a gear housing;

gearing disposed within said housing including an output shaft driven in pendulum fashion, a pinion disposed on said output shaft for rotation therewith; and

a stop member separate from said pinion, said stop member including a ring-shaped portion disposed concentrically with said shaft supportively abutting a portion of said housing and operative to establish rotational limits of travel of the output shaft, wherein the ring-shaped portion of the stop member serves as a buffer disc for axially supporting the pinion on the gear housing.

5,182,958

NON-LINEAR PROPULSION AND ENERGY CONVERSION SYSTEM

James W. Black, 312 St. George Street, Toronto, Ontario, Canada M5R 2P5

Continuation-in-part of Ser. No. 611,483, Nov. 8, 1990, which is a continuation of Ser. No. 417,048, Nov. 4, 1989, abandoned.

This application Apr. 30, 1991, Ser. No. 693,615

Int. Cl.[5] F16H *33/20*; B62D *57/00*; B63H *19/00*

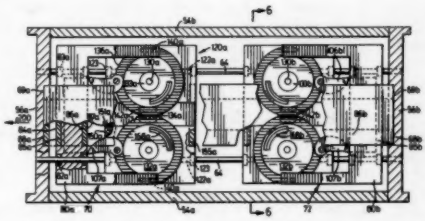
U.S. Cl. 74—84 R **51 Claims**

1. An impulse drive having a frame and an impulse generating means mounted thereon, said impulse generating means comprising:

drive means to cause relative motion between the frame and at least a portion of the impulse generating means;

means associated with the portion of said impulse generating means to impart rotation of at least one rotatable member carried by said impulse generating means and thereby convert a portion of the kinetic energy and momentum thereof to rotational kinetic energy and angular momentum of said at least one rotatable member; and

means to transfer at least some of the kinetic energy and momentum of said portion to the frame whereby the difference in kinetic energy and momentum attributable to



the rotation of the at least one rotatable member provides a net impulse to the frame in a predetermined direction.

5,182,959

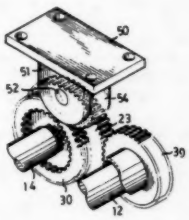
ANTI-ROLL DEVICE FOR MOTOR VEHICLES

Shyh Y. Chern, No. 111, Lane 41, Sec. 1, Hsin Jen Rd., Ta Li Hsiang, Taichung Hsien, and Wei C. F. Chiang, No. 58, Alley 122, Liuh Shan Lane, Feng Yuan City, Taichung Hsien, both of Taiwan

Filed Dec. 13, 1991, Ser. No. 806,341

Int. Cl.[5] B60K *41/26*

U.S. Cl. 74—411.5 **1 Claim**



1. An anti-roll device comprising a gear box, an input shaft and a driven shaft disposed in parallel in said gear box, a first gear fixed on said input shaft and rotated in concert with said input shaft, a second gear and a third gear fixed on said driven shaft and rotated in concert with said driven shaft, said second gear being engaged with said first gear so that said second gear and said third gear can be rotated by said first gear, an output shaft rotatably disposed in said gear box and coaxially disposed on said input shaft, said output shaft including a plurality of teeth formed on an outer peripheral surface thereof, a gear/pinion rotatably disposed on said output shaft and having a pinion portion, a disc engaged on said output shaft and having a plurality of first internal gears formed therein for sliding engagement with said teeth of said output shaft so that said disc is slidable longitudinally along said output shaft and rotated in concert with said output shaft, said disc further including a plurality of second internal gears formed therein for engagement with said pinion portion of said gear/pinion, said disc including an annular groove formed in an outer peripheral surface thereof, a shifting lever engaged in said annular groove of said disc for shifting said second internal gears of said disc to engage with said pinion portion of said gear/pinion, a plate fixed to said gear box and having a pair of lugs extended therefrom, a rod fixed between said lugs, a ring fixed on said rod, a fourth gear having an opening formed in a center thereof for engagement on said ring and having a plurality of notches formed therein, each of said notches having a gradually narrowing passage formed therein and having a roller and a spring disposed therein, each of said notches having a narrower end, said rollers being biased to move toward said narrower ends of

said notches, said forth gear being engaged with said teeth of said disc when said disc moves toward said gear/pinion, said rollers being caused to be wedged between said narrower ends of said notches and said ring when said fourth gear rotates in a first direction, thereby locking said gear and said ring together, rotation of said fourth gear in an opposite direction tending to roll said rollers against said springs so that said fourth gear may rotate freely in said opposite direction.

5,182,960

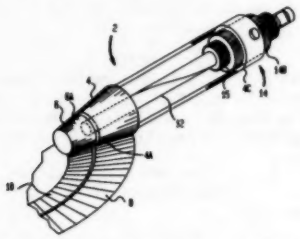
BEVEL GEAR DRIVE ARRANGEMENT

Henry H. Chary, Rancho Palos Verdes, Calif., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 10, 1991, Ser. No. 804,561

Int. Cl.[5] F16H *1/14*

U.S. Cl. 74—417 **10 Claims**



1. A bevel gear drive arrangement, comprising:

a first bevel pinion;

a second bevel pinion;

said first and second pinions being coaxially disposed and arranged so that the diametral pitch at the heel of the second pinion is equal to the diametral pitch at the toe of the first pinion;

a first bevel output gear in meshing engagement with the first pinion;

a second bevel output gear in meshing engagement with a second pinion;

said first and second output gears being coaxially disposed and rigidly coupled each to the other;

means for flexibly coupling the first and second pinions each to the other, said means includes

a quill shaft integral at one end thereof with the second pinion; and

the quill shaft is responsive to the applied torquing force for preloading the second pinion against the first pinion; and

means for applying a torquing force to the coupling means for preloading one of the first and second pinions against the other of the first and second pinions so that the load capacity of the gear drive arrangement is substantially equal to the sum of the load capacities of a first gear pair including the first pinion and the first output gear and a second gear pair including the second pinion and the second output gear.

5,182,961

THREE DEGREE OF FREEDOM TRANSLATIONAL AXIS HAND CONTROLLER MECHANISM

Israel Menahem, Clearwater, and James Bacon, Largo, both of Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 30, 1991, Ser. No. 738,255

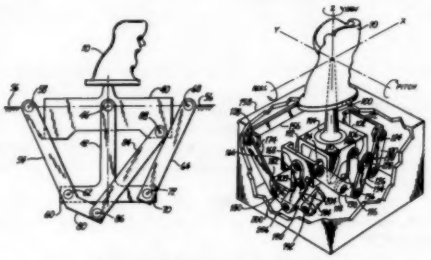
Int. Cl.[5] G05G *9/04*; B64C *13/04*

U.S. Cl. 74—471 XY **18 Claims**

1. Apparatus for moving a first member having first and second points thereon, in a first direction with respect to a base member so that the first and second points move, with respect to the base member, only parallel to the first direction comprising:

first linkage means connected to the base member and to the first member and operable to permit the first point to move, with respect to the base member, only parallel to the first direction, and;

second linkage means connected to the first linkage means and to the first member and operable to rotate the first



member, when the first member moves with respect to the base member, by an amount sufficient to cause the second point to also move, with respect to the base member, only parallel to the first direction.

5,182,962

ACTUATING FORCE TRANSMISSION UNIT FOR A GEAR CHANGE MECHANISM OF A BICYCLE

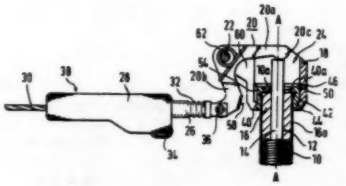
Berndt Leiter, Waigolshausen, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 30, 1991, Ser. No. 768,997

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1990, 4031763

Int. Cl.[5] F16H *59/02*

U.S. Cl. 74—473 R **19 Claims**



1. An actuating force transmission unit for connecting an actuator device and a gear change mechanism of a bicycle hub,

said bicycle hub having an axle (**10**) and an axial bore (**12**) within said axle (**10**) along an axis of said axle (**10**), said axle (**10**) having an externally threaded axial end portion (**16**) adapted to be connected with a housing (**18**) of said actuating force transmission unit (**24**), said axial bore (**12**) accommodating a push member (**14**) acting onto said gear change mechanism,

said actuating force transmission unit comprising a housing (**18**) adapted to be mounted onto said axial end portion (**16**) of said axle (**10**) by internal thread means (**52**) engageable with said externally threaded end portion (**16**), a transmission lever (**20**) being pivotally mounted on said housing (**18**) about a pivot axis (**22**) substantially orthogonal with respect to said axis (A—A) of said axle (**10**), said transmission lever (**20**) having a first lever arm (**20*a***) engageable with said push member (**14**) and a second lever arm (**20*b***) adapted for being connected with actuating force transmitting means (**30**) extending between said second lever arm (**20*b***) and said actuator device,

said internal thread means (**52**) being provided within a sleeve member (**40**) having a sleeve axis (B-B), said sleeve member (**40**) being mounted with respect to said housing (**18**) such as to be rotatable with respect to said housing

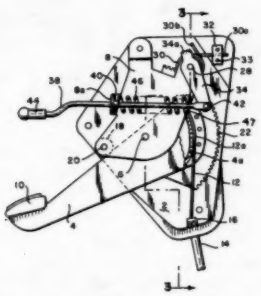
(18) about said sleeve axis (B-B) and to be fixed with respect to said housing (18) along said sleeve axis (B—B).

5,182,963

SOFT RELEASE CONTROL MECHANISM WITH SPRING CLUTCH AND VISCOUS DAMPING

Randal J. Perisho; Robert L. Heimann, both of Moberly, and Wayne L. Soucie, Columbia, all of Mo., assignors to Orscheln Co., Moberly, Mo.

Filed Aug. 27, 1991, Ser. No. 750,298
Int. Cl.[5] G05G 1/14
U.S. Cl. 74—512 **7 Claims**



1. A soft-release parking brake control mechanism for applying tension to a parking brake cable, comprising:

(a) a mounting bracket (2);

(b) means including a parking brake lever (4) pivotally connected with said bracket and with one end of the parking brake cable, said lever being pivotable in one direction toward a brake-applied position in which said cable is tensioned;

(c) resilient bumper means (18) connected with said bracket for limiting pivotal movement of said lever in the opposite direction toward a brake-released position relative to said bracket;

(d) means for retaining said lever in said brake-applied position, said retaining means including:

(1) a cylindrical clutch drum (26) rotatably connected with said mounting bracket, said drum being formed of an iron-nickel powdered metal admixture impregnated with a polyalphaolefin damping oil, said clutch drum having inner pores and an outer surface with a layer of said damping oil thereon;

(2) gear means (22,24) connecting said drum with said lever for rotation in opposite directions as said lever is pivoted between its brake-applied and brake-released positions, respectively; and

(3) a helical clutch spring mounted on centrically on said drum, said spring including at opposite ends a pair of end portions one of which is connected with said bracket, said spring having coil turns the diameter of which is such relative to the diameter of said drum that said spring is normally resiliently contracted radially inwardly into functional engagement with the outer periphery of the drum, thereby to permit rotation of the drum in a first direction relative to said bracket, when said lever is pivoted toward the brake-applied position, in accordance with the direction of turn of said spring coil turns, said clutch spring normally preventing rotation of said drum in the opposite directions;

(e) release means for displacing the other end of said spring to progressively expand said spring relative to said drum; and

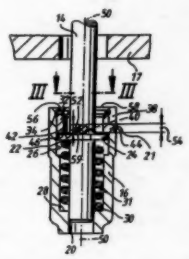
whereby the layer of said damping oil between said drum and the inner periphery of said spring causes a resistance to motion between said drum and said spring and whereby the frictional heat caused by said resistance to motion perpetuates the soft release properties of said mechanism by forcing said polyalphaolefin damping oil from the inner pores of the drum to the outer surface of the drum.

5,182,964

CHANGE-SPEED GEARBOX HAND LEVER CONNECTING DEVICE

Harald Gellner, Marbach, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Jan. 29, 1991, Ser. No. 647,506
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1990, 4003899
Int. Cl.[5] G05G 9/47, 1/04
U.S. Cl. 74—523 **19 Claims**



1. A device for releasably connecting a hand lever via a joint to a setting linkage for selecting gears of a change-speed gearbox, comprising a rod-shaped lever part fixed relative to the hand lever; a sleeve-shaped acceptance part for the lever part; a sliding guide, fixed relative to one half of the joint for the lever part; a support part fixed relative to the lever part; a first supporting ring configured to support the support part fixed relative to the hand lever; a guide for the axial displacement of the supporting ring relative to the acceptance part; an abutment fixed relative to the acceptance part; a spring between the supporting ring and the abutment, a second supporting ring operating as a holding-down device for the support part fixed relative to the hand lever; a releasable stop operatively held on the acceptance part for one of the first and second supporting rings for accepting a force of the spring; means for fixing the lever part in a defined angular position relative to the acceptance part, including a first positioning element fixed relative to one of the supporting rings, a first catch fixed relative to the acceptance part for fixing one of the supporting rings with the first positioning element in the defined angular position, a second positioning element and a corresponding second catch arranged that the lever pat can be fixed relative to the one supporting ring fixed with the first positioning element whenever the lever part is brought into the defined angular position, wherein the supporting rings are moveable relative both to one another and to the lever part, the second supporting ring operating as the holding-down device is provided with both the first positioning element and an assembly slot for feeding through the second positioning element and configured to be fixed relative to the acceptance part in one direction of a support axis via the releasable stop and in an opposite direction of the support axis pointing towards the abutment via a further stop, the second positioning element is fixed relative to the lever part but is movable relative to the supporting rings, the second catch is provided on an end face of the second supporting ring which faces towards the first supporting ring, the second catch is offset relative to the assembly slot by a rotational difference angle, the sliding guide is fixed relative to the acceptance part, the acceptance part is fixed relative to the one half of the joint for the lever part.

5,182,965

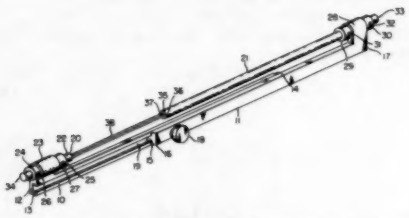
ADJUSTABLE LENGTH HANDLE COMPRISING AUTOMATICALLY ADJUSTABLE LENGTH MECHANICAL POWER TRANSMISSION

Donald M. MacMillan, Chilliwack, Canada, assignor to Concorde Tool Corp., Surrey, Canada

Continuation-in-part of Ser. No. 588,055, Sep. 24, 1990, Pat. No. 5,088,147. This application Nov. 4, 1991, Ser. No. 787,036

Int. Cl.[5] G05G *1/10*

U.S. Cl. 74—543 **2 Claims**



1. An adjustable length handle incorporating adjustable length mechanical power transmission apparatus, said handle comprising:

first and second structural components, having first and second longitudinal axes, said components being slidably interconnected such that relative motion between said components is parallel to said longitudinal axes,

means for unlockably locking to each other,

said mechanical power transmission apparatus comprising first and second transmission components, said first and second transmission components having third and fourth longitudinal axes,

said first, second, third and fourth longitudinal axes being parallel,

said first transmission component being mounted on said first structural component,

said first and second transmission components being slidably interconnected by interconnecting means for transmitting power, said interconnecting means allowing relative motion between said transmission components parallel to said longitudinal axes,

whereby said length of said adjustable length mechanical power transmission apparatus is adjusted automatically when the length of said adjustable length structure is adjusted.

5,182,966

CONTROL MECHANISM FOR A HYDROSTATIC TRANSAXLE

Roland L. von Kaler, Tecumseh, and Dale I. Havens, Addison, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed Jul. 22, 1991, Ser. No. 733,455

Int. Cl.[5] F16D *39/00*

U.S. Cl. 74—606 R **16 Claims**

1. A hydrostatic transaxle comprising:

a housing having an upper part and a lower part;

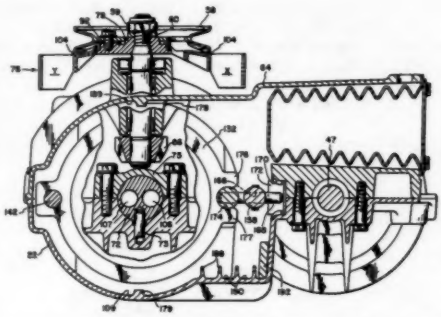
a hydrostatic transmission disposed within said housing, said transmission including a conduit, a radial piston type pump disposed on said conduit, and a radial piston type motor disposed on said conduit coaxial to said pump and in fluid communication therewith through said conduit, said pump having a plurality of radially disposed displaceable pistons, said motor having a plurality of radially disposed displaceable pistons;

gearing operably connected to said motor;

an axle assembly including differential means for operably connecting said gearing to said axle assembly, said axle assembly disposed parallel to said conduit;

said hydrostatic transmission having an inboard side adjacent said axle assembly and an opposite outboard side;

adjustment means for varying the displacement of said pistons, said adjustment means having a pivot axis on said outboard side of said transmission, said pivot axis disposed parallel to said axle assembly; and



a control mechanism disposed at said inboard side between said axle assembly and said conduit for controlling said adjustment means.

5,182,967

LEVER APPARATUS HAVING A FREELY MOVABLE FULCRUM AND MECHANICAL APPARATUS USING THE SAME

Yasuo Yoshizawa, and Mitsuo Kato, both of Yonezawa, Japan, assignors to Yoshiki Industrial Co., Ltd., Yamagata, Japan

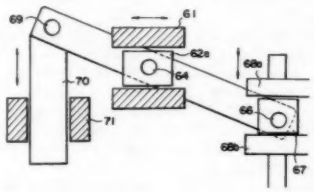
PCT No. PCT/JP90/00737, § 371 Date Feb. 4, 1991, § 102(e) Date Feb. 4, 1991, PCT Pub. No. WO90/15268, PCT Pub. Date Dec. 13, 1990

PCT Filed Jun. 6, 1990, Ser. No. 635,517

Claims priority, application Japan, Jun. 8, 1989, 1-146304

Int. Cl.[5] F16H *21/44*; G05G *1/04*

U.S. Cl. 74—834 **7 Claims**



1. A movable fulcrum type lever apparatus comprising:

a lever member having a force point, a fulcrum point and an action point;

fulcrum means for pivotally supporting said lever member at said fulcrum point such that said lever member is swingable about said fulcrum point;

fulcrum guide groove means including a guide groove extending linearly in a longitudinal direction of said lever member for guiding said fulcrum means movably in the longitudinal direction crossing a swinging direction of said lever member along said guide groove;

a force point regulator connected to said force point of said lever member for applying a swinging force to said lever member crossing the longitudinal direction of said lever member; and

an action point regulator connected to said action point of said lever member for applying an action force to an action receiving member;

wherein said force point regulator includes a regulator slider pivotally mounted at said force point of said lever member and a pair of regulator guide plates between which said

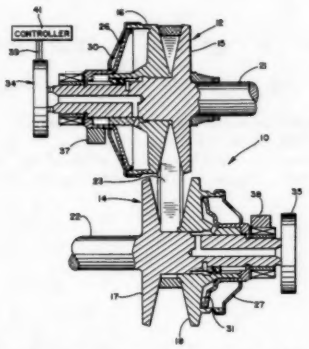
regulator slider is in sliding contact, whereby said force point moves along said guide plates to draw a curved locus, said fulcrum point moves linearly in the longitudinal direction of said fulcrum guide groove, and said action point has a linear locus, when said lever member swings about said fulcrum point thereof.

5,182,968

FORCE RATIO CONTROL OF CONTINUOUSLY VARIABLE TRANSMISSIONS

Philip J. Mott, Dryden, N.Y., assignor to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights

Filed Oct. 16, 1991, Ser. No. 777,000
Int. Cl.[5] F16H *55/56*
U.S. Cl. 74—856 **10 Claims**



1. In a continuously variable transmission having a primary pulley, a secondary pulley, and an endless belt interconnecting the primary and secondary pulleys, a method for controlling the pressure on the secondary pulley, comprising the steps of:

sensing the speed of the primary pulley;

sensing the speed of the secondary pulley;

sensing the force applied to the belt by the primary pulley;

sensing the force applied to the belt by the secondary pulley;

determining the measured speed ratio from said sensed speeds;

determining a measured force ratio from said sensed forces;

determining a desired force ratio from a look-up table in the controller, said desired force ratio being determined on the basis of a predetermined factor of safety and the determined speed ratio;

comparing said measured force ratio with said desired force ratio;

modifying the secondary force applied to the belt by the secondary pulley.

5,182,969

HYDRAULIC CONTROL DEVICE FOR AUTOMATIC TRANSMISSION

Shigeki Goto, Kariya, Japan, and , assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 21, 1990, Ser. No. 525,682
Claims priority, application Japan, May 19, 1989, 1-24177
Int. Cl.[5] F16H *5/64*; B60K *41/16*
U.S. Cl. 74—866 **5 Claims**

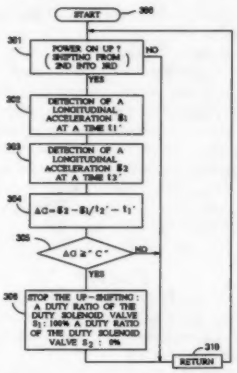
1. An hydraulic control device for an automatic transmission comprising:

plurality of control valves hydraulically connected to related friction engaging elements;

a plurality of solenoid duty valves connected to said plurality of control valves for supplying hydraulic pressure thereto;

checking means for checking whether an upshift of the transmission is performed;

detecting means for detecting at least one value of engine RPM and longitudinal acceleration of said vehicle during the upshift, said detecting means includes detecting the RPM of the engine and calculating a change of RPM of the engine with respect to time; and


START
300
POWER ON UP ? (SHIFTING FROM 2ND INTO 3RD)
NO
YES
DETECTION OF A LONGITUDINAL ACCELERATION G1 AT A TIME t1'
DETECTION OF A LONGITUDINAL ACCELERATION G2 AT A TIME t2'
ΔG=G2−G1/t2'−t1'
ΔG ≧ "C"
NO
YES
STOP THE UP−SHIFTING : A DUTY RATIO OF THE DUTY SOLENOID VALVE S1 : 100% A DUTY RATIO OF THE DUTY SOLENOID VALVE S2 : 0%
RETURN

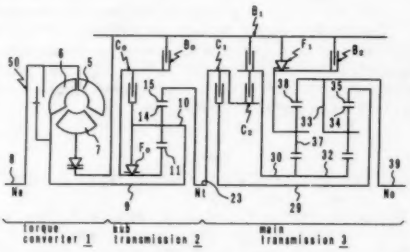
abnormal condition detecting means for detecting abnormal conditions based on a comparison of one of said detected values with a predetermined value.

5,182,970

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Shigeki Goto, Kariya; Masato Shimei; Tetsuhiro Miyazawa, both of Nagoya; Yoshitami Saitou, Aichi, and Nobuyuki Isono, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 3, 1991, Ser. No. 679,926
Claims priority, application Japan, Apr. 4, 1990, 2-89598; Apr. 4, 1990, 2-89599
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—866 **2 Claims**



2. A hydraulic control system for automatic transmission comprising:

a hydraulic circuit for selectively supplying an oil pressure to or selectively removing an oil pressure from brakes and clutches used in an automatic transmission which is disposed between an output shaft of an engine and a load driving shaft;

accumulators in the hydraulic circuit and connected to the brakes and clutches;

an electrically energized pressure control valve for regulating back pressure on each of the accumulators;

accumulator pressure control means for controlling an energization level of the pressure control valve to control the back pressure on the accumulators during a shift operation of the automatic transmission;

shift time detecting means for determining a time interval from a commencement to an end of a switching in a mechanical coupling of the automatic transmission during the shift operation;

oil temperature detecting means for detecting the oil temperature of the automatic transmission; and

accumulator pressure control means responsive to the time interval determined by the shift time detecting means and the oil temperature to update the energization level of the pressure control valve in a direction such that the back pressure on the accumulator is increased if the determined time interval is greater than a predetermined time interval and decreased if the detected oil temperature is greater than a predetermined oil temperature.

5,182,971

BUTTON SHARPENING

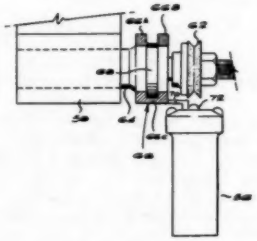
David S. Williams, Krugersdorp, South Africa, assignor to Boart International, Limited, Sandton, South Africa

Division of Ser. No. 654,209, Feb. 12, 1991. This application Mar. 12, 1992, Ser. No. 849,879

Claims priority, application South Africa, Feb. 14, 1990, 90/1118; Aug. 21, 1990, 90/6616

Int. Cl.[5] B24B *7/10*

U.S. Cl. 76—5.1 **8 Claims**



1. A machine for restoring the buttons of a button bit, the machine comprising a grinding wheel with a V-groove at its periphery, means for locating and non-rotatably holding a button bit relative to the grinding wheel with a button which is to be restored in alignment with the periphery of the wheel, and means for causing relative movement to take place in one plane only between the button bit and the wheel such that the button is fed into the V-groove with the result that the head of the button is formed to a chisel shape.

5,182,972

IMPROVED FINGER TIP MOUNTED HOLDING DEVICE

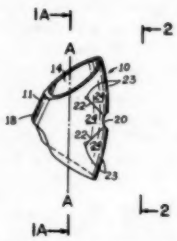
Robert A. Skaleski, 18 Lakeview Dr., Ridgefield, Conn. 06877

Filed Mar. 28, 1991, Ser. No. 618,990

Int. Cl.[5] B25C *3/00*

U.S. Cl. 81—44 **5 Claims**

1. An improved finger mountable device for temporarily holding an object while an operation is performed utilizing said object, said improved device comprising a tubular elastomeric body, said tubular elastomeric body having a wall, a first open end for receiving said finger and a second open end for passing a finger tip therethrough, a hole through said elastomeric wall, a plurality of slits radiating outwardly from said hole to form slaps circumferentially around said hole, said flaps elastically dilating to accept said object being placed therethrough, so that at least a portion of said object to be temporarily held is



placed between said finger and said hole and flaps whereby said object will be elastically held in position by said flaps.

5,182,973

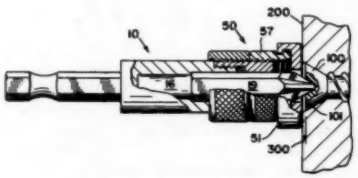
DEPTH LOCATOR APPARATUS FOR INSERT BIT HOLDERS

J. Richard Martindell, 10534 Wheatridge Dr., Sun City, Ariz. 85373

Continuation-in-part of Ser. No. 526,686, May 21, 1990, Pat. No. 5,012,708, which is a continuation of Ser. No. 391,648, Aug. 7, 1989, abandoned, which is a continuation of Ser. No. 257,272, Oct. 13, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 662,119

Int. Cl.[5] B25B *23/00*

U.S. Cl. 81—429 **6 Claims**



1. A depth locating apparatus to control the depth of a driven screw type fastener head relative to the surface of the work being fastened, comprising, in combination:

a bit holder having a cylindrical body and a socket in the body for receiving a bit;

an external threaded portion disposed on the cylindrical body about the socket;

an insert type screwdriving bit disposed in the socket;

sleeve means secured to the bit holder, including

a bore having a threaded portion for engagement with the external threaded portion of the cylindrical body of the bit holder,

and outer end on the threaded portion of the bore in the sleeve means through which the screwdriving bit extends, and

a threaded cylindrical external surface; and

ring means secured to the sleeve means and adjustable on the sleeve means for determining the depth of a screw type fastener head relative to the surface of the work, including

a first ring having a first circular bore threaded to engage the threaded cylindrical external surface of the sleeve means,

cap means secured to the first ring for engaging the work surface and rotatable relative to the first ring, and

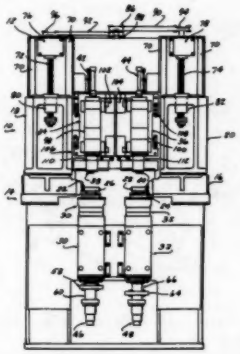
a second ring having a second circular bore threaded to engage the threaded cylindrical external surface of the sleeve means and disposed against the first ring to comprise a locking ring for locking the first ring in place on the sleeve means.

5,182,974

DUAL SPINDLE VERTICAL AXIS CNC PISTON TURNING AND GROOVING MACHINE

A. Mario Cudini, Grosse Point Farms; Horst Roman, Sterling Heights, and Kenneth A. Drew, Harper Woods, all of Mich., assignors to The Cross Company, Fraser, Mich.

Filed Jun. 17, 1991, Ser. No. 716,186
Int. Cl.[5] B23B 3/34
U.S. Cl. 82—124 **10 Claims**



1. A dual spindle piston turning and grooving machine (10) for simultaneous turning of non round, complex profiles of diameters of two pistons and also grooving of the diameters of said pistons, comprising:

a pair of spaced apart linear motor turning modules (14, 16) each carrying a turning tool electrically controlled to move in and out along an axis, each turning module arranged with its axis horizontal and facing the other turning module;

a machine frame having a front and back;

a pair of main slides (18, 20) each mounting a turning module (14, 16), each main slide mounted at the front of said machine frame to be vertically movable on said machine frame;

means (72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96) for raising and lowering each of said main slides (18, 20) to and between lowered and raised positions;

a pair of vertical axis spindles (30, 32) mounted on said machine frame between said turning modules, each vertical axis spindle extending alongside a respective turning module (14, 16) and located inside and between said pair of turning modules (14, 16);

means (50, 52, 54, 56, 58, 60, 62, 64, 66) for rotating each spindle (18, 20) about its vertical axis;

a piston clamping chuck (26, 28) mounted in each spindle (30, 32) adapted to receive and hold a respective piston (W) to be rotated by a respective spindle (30, 32);

each turning module in the lowered position of an associated main slide aligned with a piston in a respective adjacent chuck and in a raised position of said associated main slide clearing the area to the outside of the associated chuck;

a pair of vertical axis tailstock assemblies (34, 36) each aligned with and vertically spaced from a respective spindle (18, 20), each tailstock assembly (34, 36) having a tailstock portion (38, 40) and means (42, 44) for moving each tailstock portion (38, 40) axially to engage and disengage said tailstock portion (38, 4) with a piston (W) in a respective chuck (26, 28);

a pair of grooving mechanisms (106, 108) each mounted on said machine frame behind a respective tailstock assembly (34, 36) and spindle (30, 32), each grooving mechanism (106, 108) including a vertically extending support shaft (110, 112) rotatable about the longitudinal axis thereof, and means (118, 120, 122, 124) for rocking each of said support shafts (110, 112) about said vertical longitudinal axis in either direction;

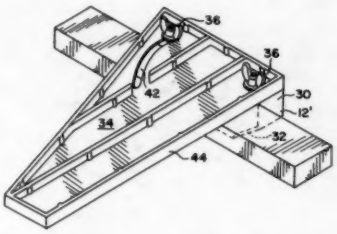
grooving tooling (114, 116) mounted to each support shaft (110, 112) brought into engagement by said rocking of said support shaft (110, 112) in either direction.

5,182,975

GUIDE FOR PORTABLE POWER SAW

John L. Warner, 2 Vining Dr., Simsbury, Conn. 06070

Filed Apr. 26, 1991, Ser. No. 692,227
Int. Cl.[5] B27B 9/04
U.S. Cl. 83—745 **8 Claims**



1. Saw guide apparatus comprising a sole plate for disposition on top of a work-piece, said sole plate having opposite ends and a straight saw guiding edge on the sole plate between said opposite ends, an elongated, rigid, rectangularly cross sectioned, parallel sided gauge bar, a resilient bar clamp on the sole plate at an angle to the saw guiding edge,

the sole plate having a substantially flat bottom surface for contact with the work-piece and an upper surface, the saw guiding edge extending between said bottom and upper surfaces at a right angle to said bottom surface and the clamp extending downwardly from the bottom surface away from said upper surface and located at one end of said sole plate,

said clamp being generally U-shaped having an upper leg formed at least in part by said bottom surface of said sole plate, a lower leg having a free edge extending along its length, and a straight base portion between said upper and lower legs, said said straight base portion extending downwardly from said sole plate and having a straight flat surface located between said upper and lower legs which is normal to said bottom surface of said sole plate, said lower leg being resilient and angled with respect to said base portion to underlie the sole plate, said upper and lower legs together with said base portion forming between them an elongated open ended slot having an opening opposite said base portion,

said elongated, rigid, rectangularly cross sectioned gauge bar being frictionally held within said elongated open ended slot with one side of said bar contiguous with said straight flat surface of said base portion and another side of said bar forcing said second leg to resiliently deflect downwardly,

said bar being of a length substantially longer than said slot and having one end extending outwardly from one end of said slot across said saw guiding edge, so that the end of said bar extending across said saw guiding edge is a precise distance from said saw guiding edge,

the width of said bar being greater than the distance between said free edge of said lower leg and said base portion of said clamp so that the side of said bar opposite to the side held contiguous to said straight flat surface of said base portion is located beyond the free edge of the lower leg of said clamp whereby it may directly contact a side edge of the work-piece on which the sole plate is adapted to be disposed,

said lower leg being slanted toward said sole plate and being resiliently yieldable away from said sole plate when said

gauge bar is positioned within said slot to firmly secure the gauge bar in said slot.

5,182,976

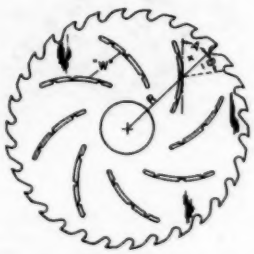
SPRING BEAMED SHOCK ABSORBING CIRCULAR SAW BLADE BODY

Connell A. Wittkopp, Columbus, Ohio, assignor to The Peerless Saw Company, Groveport, Ohio

Continuation-in-part of Ser. No. 676,540, Nov. 30, 1984, abandoned, and a continuation-in-part of Ser. No. 531,222, Sep. 9, 1983, abandoned. This application Nov. 12, 1986, Ser. No. 929,991

Int. Cl.[5] B27B *33/08;* **B23D** *61/02*

U.S. Cl. 83—835 **5 Claims**



1. In a circular saw blade body having integral sections comprising a central drive collar and a peripheral circumferential cutting edge for cutting a material, connected by a middle annular section, and a plurality of narrow curved extended slots cut through the saw blade body between the collar and the cutting edge, the improvement comprising:

a nib protruding from one internal side of a curved slot a predetermined distance across the width of the slot towards the facing internal side of the curved slot to provide a stop means, upon the sudden absorption of a load by the blade, for limiting the blade's physicial deformation to a predetermined degree such that the yield strength of the metal material forming the blade body is not exceed when the blade encounters the sudden load, said nib comprising an element intrinsicially formed from the metal material of the saw blade body and having a small width in comparison to the overall length of the side of the slot from which it protrudes.

5,182,977

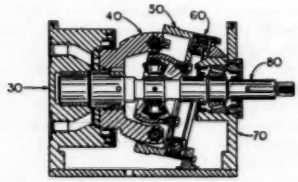
HYDRAULIC CENTRIFUGAL PISTON MOTOR

William Gulbrantson, 3153 Kilkenny Dr., Riverside, Calif. 92503-5315

Filed Sep. 12, 1991, Ser. No. 761,174

Int. Cl.[5] F01B *13/04*

U.S. Cl. 91—197 **5 Claims**



4. An hydraulic piston motor according to claim 1 wherein a universal coupling means is provided for synchronizing said rotating assemblages to produce unidirectional torque axially to the output drive shaft.

5,182,978

BENT AXIS TYPE VARIABLE DISPLACEMENT HYDRAULIC MACHINE

Yoshimichi Akasaka, Tsuchiura; Ichiro Nakamura, Katsuta, and Yasuharu Gotoh, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

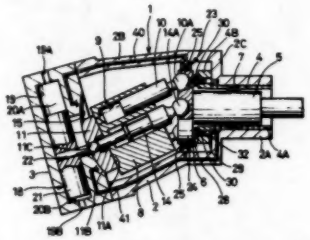
PCT No. PCT/JP89/01007, § 371 Date Jan. 30, 1990, § 102(e) Date Jan. 30, 1990, PCT Pub. No. WO90/04101, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 3, 1989, Ser. No. 460,066

Claims priority, application Japan, Oct. 3, 1988, 63-249559

Int. Cl.[5] F01B *13/04*

U.S. Cl. 91—499 **10 Claims**



1. In a bent axis type variable displacement hydraulic machine including:

a cylindrical casing having a head casing with suction and discharge passages;

a rotational shaft rotatably inserted into said casing and having a drive disc at the distal end thereof disposed in said casing; a cylinder block located in said casing and having a plurality of axial cylinder bores;

a plurality of pistons reciprocably received in said cylinder bores in said cylinder block and each pivotally supported at one end by said drive disc; a valve plate having a suction port and a discharge port and formed with a switching surface on one end face in sliding contact with said cylinder block and a sliding surface on another end face in tilting sliding contact with a tilting slide surface on said cylinder block; a tilting mechanism for tilting said valve plate together with said cylinder block; and hydrostatic bearing means provided between said drive disc and casing and forming a radial hydrostatic bearing and thrust hydrostatic bearing to support a radial load and a thrust load, respectively, exerted on said drive disc by hydraulic reaction forces;

a variable throttle means provided between said head casing and valve plate and adapted to produce a first pressurized fluid and a second pressurized fluid modulated in correspondence with a tilt angle of said cylinder block for supply of said first pressurized fluid at a first pressure and in a first manner to said radial hydrostatic bearing and to supply said second pressurized fluid at a second pressure and in a second manner to said thrust hydrostatic bearing.

5,182,979

LINEAR POSITION SENSOR WITH EQUALIZING MEANS

Denny E. Morgan, San Diego, Calif., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 2, 1992, Ser. No. 844,024

Int. Cl.[5] F01B *25/26;* **G01N** *22/00*

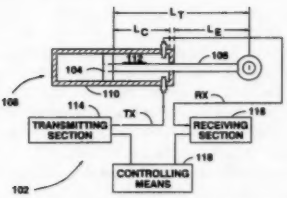
U.S. Cl. 92—5 R **13 Claims**

1. An apparatus for detecting a linear position of a piston and a piston rod being movable within a housing of a hydraulic cylinder, comprising:

means for producing an electromagnetic signal and delivering said electromagnetic signal into said hydraulic cylinder, said electromagnetic signal having a frequency vary-

ing between predetermined minimum and maximum values;

means for determining a resonant frequency of the hydraulic cylinder, said resonant frequency detecting means including means for sensing an electromagnetic wave signal within said hydraulic cylinder and equalizing said received electromagnetic signal, said equalization accounting for the losses of said hydraulic cylinder, comparing said equalized electromagnetic wave signal with a predetermined constant and responsively producing a frequency signal, said frequency signal being indicative of said resonant frequency; and



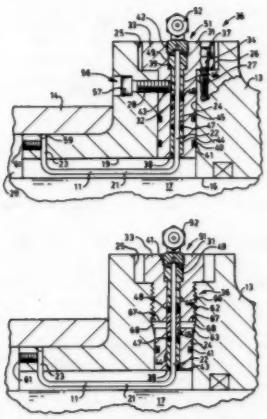
means for receiving said frequency signal and responsively determining the position of said piston and piston rod.

5,182,980

HYDRAULIC CYLINDER POSITION SENSOR MOUNTING APPARATUS

Robert D. Greer, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Feb. 5, 1992, Ser. No. 831,709
Int. Cl.[5] F01B *25/26*
U.S. Cl. 92—5.00 R **15 Claims**



1. A position sensor mounting apparatus for positioning a sensor element within an actuating chamber of a hydraulic cylinder comprising:

means defining a bore in the hydraulic cylinder opening into the actuating chamber;

a cylindrical housing positioned in the bore and having an axially extending bore opening into the actuating chamber;

means for fastening the cylindrical housing to the hydraulic cylinder;

a resilient tubular insulator disposed in the housing bore with the sensor element extending therethrough;

means for retaining the insulator within the cylindrical housing; and

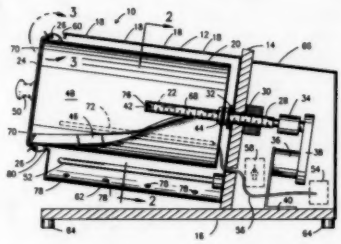
means for squeezing the insulator radially inwardly so that a clamping force is exerted on the sensor element.

5,182,981

REVOLVING PEANUT ROASTING APPARATUS

Robert Wilcox, 1271 Driftwood Ave., Clearwater, Fla. 34624

Filed Jul. 1, 1992, Ser. No. 907,371
Int. Cl.[5] A47J *27/62, 37/04, 37/06;* F26B *19/00*
U.S. Cl. 99—333 **15 Claims**



1. A revolving nut roasting apparatus comprising

a cylindrical housing mounted at a first closed end on a support frame anchored to a flat base member, the cylindrical housing being at an acute angle with respect to the base member and having a plurality of air passage openings,

a shaft driven by an electric motor at less than eight revolutions per minute, the shaft rotating within a bearing, mounted within a bearing support, attached to the support frame,

the shaft having a drive slot through an end distal from the motor, the drive slot engaging a drive pin in a drive hub affixed to a base end of a removable rotating drum mounted on the shaft within, but spaced apart from, an inner wall of the cylindrical housing,

multiple blending vanes attached to an inner wall of the removable rotating drum and a cover enclosing a front open end of the rotating drum,

an electric heating apparatus element mounted on the support frame within a bottom portion of the cylindrical housing below the rotating drum so that nuts placed within the rotating drum can be slowly tumbled while being roasted.

5,182,982

CONTINUOUS VACUUM FRIER

Ryuichi Hattori, Kyoto, and Nobuhide Nakagawa, Kashihara, both of Japan, assignors to House Food Industrial Co., Ltd., Osaka, Japan

Filed Jul. 19, 1990, Ser. No. 554,378
Claims priority, application Japan, Jul. 20, 1989, 1-188015
Int. Cl.[5] A47J *37/12;* B04B *5/10*
U.S. Cl. 99—404 **26 Claims**

14. Apparatus for frying material in frying oil, comprising:

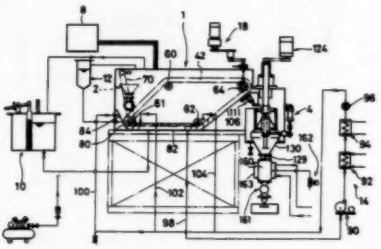
a vacuum frying chamber for receiving frying oil, said vacuum frying chamber having a bottom wall and an upper portion above said bottom wall;

vacuum means for evacuating said frying chamber;

material conveying means for conveying material in a generally horizontal plane in a direction of conveyance through frying oil in said frying chamber, said material conveying means including an endless belt having a plurality of openings formed therein and a plurality of partitioning members fixedly extending outwardly from said endless belt, said endless belt including a generally horizontal portion positioned in said frying chamber and said horizontal portion having an upstream end proximate a position at which frying of the material begins and a downstream end

proximate a position at which frying of the material terminates, said endless belt further including an upstream portion upstream of said upstream end of said horizontal portion and a downstream portion downstream of said downstream end of said horizontal portion, said endless belt following a curved path at said upstream end where said upstream portion joins said horizontal portion, said partitioning members extending downwardly at said horizontal portion, said partitioning members defining a plurality of compartments which receive the material and in which the material is fried and conveyed, and said partitioning members having tip portions, said tip portions moving in a path parallel to said endless belt;

guide means for guiding the material into said compartments, said guide means extending at an acute angle to the



path of said tip portions at said upstream portion of said endless belt;

a curved surface partially surrounding said endless belt at said upstream end, said curved surface following the path of said tip portions of said partitioning members, and said curved surface having a lower end joined to said bottom wall of said frying chamber and an upper end joined to said guide means, whereby said curved surface retains the material in said compartments adjacent said upstream end of said endless belt; and

a first oil inlet positioned upstream of said horizontal portion of said endless belt, a second oil inlet positioned downstream of said horizontal portion of said endless belt, and oil supply means for supplying oil to said endless belt through said first and second oil inlets.

5,182,983

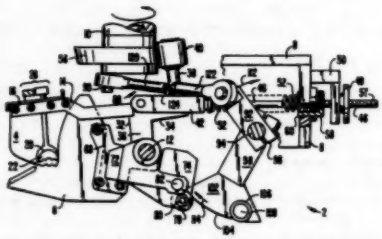
PEACH PITTER BLADE ASSEMBLY

Konrad E. Meissner, Lafayette, Calif., assignor to Atlas Pacific Engineering Company, Pueblo, Colo.

Filed Jul. 13, 1992, Ser. No. 912,537

Int. Cl.[5] A23N *4/04, 4/22*

U.S. Cl. 99—486 **12 Claims**



1. A blade assembly for a drupe pitter, the drupe pitter having a main shaft and a frame, the blade assembly comprising:

a support shaft coupled to the frame;

an upper blade and a lower blade positioned in a common plane, the upper blade pivotally coupled to the support shaft and movable between a first position and a second position in said plane, the lower blade coupled to the support shaft and movable between a third position and a fourth position in the suture plane, wherein when the upper blade and the lower blade are in the first position and the third position respectively, the blade assembly is in an open position and when the upper blade and the lower blade are in the second position and the fourth position respectively, the blade assembly is in a pit gripping position;

means for pivoting the upper blade about the support shaft in a reciprocating manner, the upper blade pivoting means coupled to and driven by said main shaft;

means for pivoting the lower blade about the support shaft in a cyclic manner, the lower blade pivoting means including a carriage coupled to the lower blade, a lower blade drive arm, and crank arm coupled to the main shaft and coupled to said lower blade drive arm,

means on said drive arm for maintaining said lower blade in said fourth position during a predetermined portion of a cycle of operation.

5,182,984

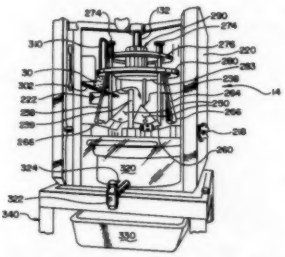
AUTOMATED CITRUS FRUIT JUICE PRESS

Richard C. Wagner, Frankfort, Ill., assignor to Hollymatic Corporation, Countryside, Ill.

Filed Sep. 16, 1991, Ser. No. 760,169

Int. Cl.[5] A23N *1/02;* B30B *9/02*

U.S. Cl. 99—509 **36 Claims**



1. A pressing apparatus for extracting juice from citrus fruit, comprising:

upright blades extending radially outwardly from a generally vertical upright axis to define V-shaped segments therebetween, the upper edges of said blades being generally sloped downwardly toward said upright axis to generally support a piece of fruit centrally to said upright axis;

peel ejectors within each of said V-shaped segments, each of said peel ejectors comprising a generally triangular plate pivotally supported for movement between a generally horizontal ready position and an ejecting position generally sloped downwardly away from the upright axis;

a press supported for vertical reciprocation, said press including slots therein allowing said press to pass over said blades;

means for reciprocably driving the press between an upper feed position allowing a piece of fruit to be located on said upright blades and a lower pressing position a selected spacing above the peel ejectors;

means for disposing said peel ejectors in their ready position when said press is moved toward the pressing position; and

means for pivoting said peel ejectors toward their ejecting position when said press is moved toward the feed position.

5,182,985

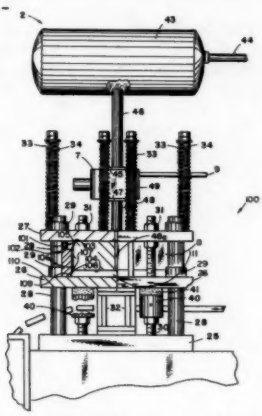
PNEUMATIC PRESS WITH REVERSED PISTON AND CYLINDER

Timothy A. Gutowski, Spring Lake, Mich., assignor to Contour Roll Company, Grand Haven, Mich.

Filed Mar. 21, 1991, Ser. No. 672,955

Int. Cl.[5] B30B *1/38*

U.S. Cl. 100—35 **8 Claims**



8. A method for reducing the tendency of a pneumatic press to vibrate:

providing a press with mating platens including a fixed platen, a reciprocating platen, and a fluid actuated ram for selectively moving said reciprocating platen at high speed, said ram including a piston and a mating cylinder adapted to be operably connected to said fixed and reciprocating platens, respectively, the mass of said cylinder being less than the mass of said piston said cylinder and said reciprocating platen being securely interconnected to define a combined mass that minimizes the moving mass and resulting inertia generated during operation of said press;

operably connecting said piston to said fixed platen, such that said piston is generally stationary during press operation;

connecting said cylinder to said reciprocating platen such that said cylinder reciprocates therewith during press operation; and

moving the reciprocating platen and the cylinder at high speed while holding the piston stationary, thereby reducing press vibration.

5,182,986

METHOD FOR REALIGNING STEEL BANDS WITH RESPECT TO A LONGITUDINAL AXIS OF A CONTINUOUSLY WORKING PRESS

Friedrich B. Bielfeldt, Eppingen, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Mar. 21, 1991, Ser. No. 672,668

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1990, 4017812

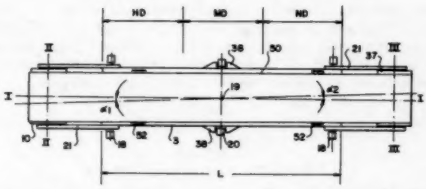
Int. Cl.[5] B30B *5/06*

U.S. Cl. 100—41 **6 Claims**

1. A method of guiding first and second endless steel bands about a longitudinal axis of a continuously working press for the manufacture of pressed boards, said press having multiple pressure regions which are of different pressure levels and short-stroke pressure cylinders, said bands transmitting pressing pressure to the material to be pressed and drawing said material through said press, said method comprising the steps of:

(A) guiding said first and second bands, via driving drums and return drums, around a pressing ram and a pressing table, respectively;

(B) supporting said steel bands, with an adjustable pressing gap formed therebetween, on a plurality of co-rotating steel rods which are guided with their axes of rotation extending transversely to the direction of travel of said bands; and



(C) realigning said first steel band with respect to a longitudinal center-line of said press and said pressing table, said realigning step comprising the steps of

(i) relieving pressure in short-stroke pressure cylinders located in a high-pressure region of said press, and then

(ii) horizontally rotating said pressing ram and those pressure rollers and pressure drums which are connected to said pressing ram through an angle α about a vertical axis of rotation which is located in the longitudinal center-line of said press.

5,182,987

ROUND BALER WITH TRACKING CONTROL FOR TRACTION MEANS USED TO MOVE CROP FOR BALING

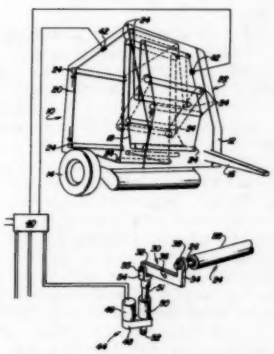
Jean Viaud, Sarreguemines, France, assignor to Deere & Company, Moline, Ill.

Filed Oct. 22, 1991, Ser. No. 781,539

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1990, 4042246

Int. Cl.[5] B30B *5/06*; A01D *39/00*

U.S. Cl. 100—87 **3 Claims**



1. In a round baler having a baling chamber formed in part by a traction means located between opposite side walls of the baler and being supported on a plurality of rolls arranged for dividing the traction means into various spans for conveying crop and rolling the crop upon itself to form a bale, said plurality of rolls including at least one roll having one end supported from one of the opposite side walls for radial adjustment rela-

tive to a longitudinal axis of the support roll, the improvement comprising: a lever having opposite first and second ends and being pivotally connected, at a location between said first and second ends, with said one of the opposite side walls; said first end of the lever being coupled to said one end of said at least one roll; tracking control means including tracking sensing means for sensing a condition of the traction means indicative of sideways or impending sideways movement of the traction means relative to a normal straight running position of the traction means and for generating a signal indicative of such condition; and an actuator means including a powered actuator pivotally mounted to said one of the opposite side walls, having a linearly adjustable rod coupled to said second end of the lever and being coupled to said sensing means for receiving said signal and being responsive to said signal for effecting linear movement of said rod and thereby adjusting said one end of said at least one roll radially in a direction and by an amount for causing the traction means to return to or remain in its straight running position.

5,182,988

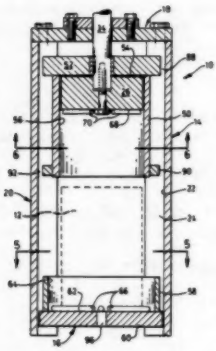
OIL FILTER CRUSHER

John Styfhoorn, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 658,495, Feb. 21, 1991, abandoned. This application Mar. 31, 1992, Ser. No. 860,256

Int. Cl.[5] B30B *9/02, 9/32*

U.S. Cl. 100—98 R **8 Claims**



1. Apparatus for crushing a fluid-type filter comprising:

a housing assembly having a base portion, a head portion, and side wall portions joining said base portion to said head portion, said side wall portions, said head portion, and said base portion defining a first chamber, and said side wall portions further defining an opening into said first chamber;

a piston positioned within said first chamber;

a power means for moving said piston longitudinally within said first chamber, including a rod member connecting said power means to said piston;

control means for selectively operating said power means;

means for supporting said housing assembly, said power means and said control means; and

a first cylindrical sleeve positioned within said first chamber, said first sleeve enclosing said piston and being adapted to move with said piston, said first sleeve and said piston defining a second chamber; and

means for controlling lateral movement of said piston as said power means moves said piston longitudinally within said first chamber, including a circular plate secured to a first end portion of said cylindrical sleeve and a ring member secured to a second end portion of said cylindrical sleeve, said circular plate and said ring member extending radially outwardly from said first cylindrical sleeve, said circular plate and said ring member cooperating with said side wall portions for controlling said lateral movement.

5,182,989

SEALING DEVICE

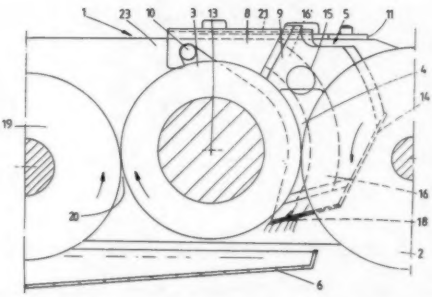
Walter D'Heureuse, Ladenburg; Martin Greive, Leimen; Gerhard Heppenstiel, Bammental, and Hans-Jürgen Kusch, Neckargemünd, all of Fed. Rep. of Germany, assignors to Heidelberg Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 518,548, May 3, 1990, abandoned. This application Jan. 22, 1992, Ser. No. 826,646

Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914648

Int. Cl.[5] B41L *23/00*

U.S. Cl. 101—148 **6 Claims**



1. In a dampening unit on an offset printing press having a dampening-solution supply, and a dampening-solution applicator roller and a metering roller rolling on one another and defining therebetween a channel for receiving therein dampening solution from the dampening-solution supply, the dampening unit having a side part located at one end of the applicator roller and the metering roller a sealing device comprising a seal holder mounted on the side part, and a sealing element formed with one side in contact engagement with said seal holder and with another side opposite from said one side closing off an end of the channel, said sealing element being formed with an overflow opening for excess dampening solution, said sealing element being formed on said one side thereof with an elongated cutout covered by said seal holder so as to form a drain passage communicating with said overflow opening, said drain passage being open at an end thereof overlying the dampening-solution supply so as to provide means for delivering the excess dampening solution to the dampening solution supply.

5,182,990

METHOD OF REDUCING PRINTING ARTIFACTS

John F. Kline, Londonderry; Frank G. Pensavecchia, Hudson; Stephen M. LaPonsey, Merrimack, and Richard A. Williams, Hampstead, all of N.H., assignors to Presstek, Inc., Hudson, N.H.

Division of Ser. No. 639,199, Jan. 9, 1991. This application Feb. 14, 1992, Ser. No. 836,987

Int. Cl.[5] B41M *1/14;* **B41C** *1/12, 1/05*

U.S. Cl. 101—211 **2 Claims**

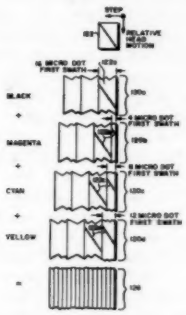
1. A method of reducing printing artifacts in a printing apparatus including a plurality of printing plates, each of which is produced by successive scans of an array of imaging devices, the printing artifacts caused by defective operation of one or more of the imaging devices, the method comprising the steps of:

for each array, selecting a different number of imaging de-

vices of the array to image an initial swath longitudinally along the associated printing plate;

positioning each array opposite the associated printing plate at differing lateral positions so that each swath begins at an identical longitudinal plate location;

imaging an initial swath on each plate by moving each printing plate relative to the associated array and selectively activating the selected imaging devices;



imaging subsequent swaths by advancing each array laterally along the associated printing plate and selectively activating all of the imaging devices of each array, thereby maintaining the differential position of each array relative to the other arrays and the respective associated plates that was established by the selection of different numbers of imaging devices for the initial swath; and

successively printing with each of the plates in registration with one another to produce a composite image.

5,182,991

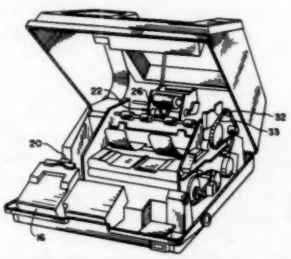
MULTI-POSITION INCREMENTAL DOCUMENT ENDORSER

Duane R. Patuszynski, Lincolnwood; John S. O'Callaghan, Wilmette, and Andrew Bartoli, Arlington Heights, all of Ill., assignors to Bell & Howell Document Management Products Company, Chicago, Ill.

Filed Aug. 27, 1991, Ser. No. 750,653

Int. Cl.[5] **B41F** *5/00*

U.S. Cl. 101—216 **16 Claims**



1. A multi-position document endorser having a plurality of endorsement positions for printing a single endorsement in a plurality of discrete locations on a moving sheet during separate passes through the endorser, comprising:

print means for placing a printed endorsement mark on a moving sheet, said print means providing a single imprint on said moving sheet;

document transport means for transporting said moving sheet;

housing means for holding said print means in a first endorsement position, said housing means having a configuration for physical translation of said housing means to permit movement of said print means to a second endorsement position; and

endorser drive means for incremental actuation of said print means in said first endorsement position to permit endorsement in a first location, said endorser drive means having a configuration for physical translation of said endorser drive means to permit actuation of said print means in said second position to permit endorsement in a second location;

wherein said endorser drive means includes a clutch means for actuation of said endorser drive means in said first and second endorsement positions, said clutch means having a configuration for physical translation of said clutch means between said first and second endorsement positions.

5,182,992

DOCTOR DEVICE FOR THE SELF-WASHING INKING UNIT OF A ROTARY PRINTING PRESS

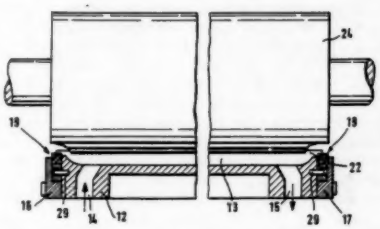
Dieter Rogge, Lengerich, Fed. Rep. of Germany, assignor to Windmöller & Hölscher, Lengerich, Fed. Rep. of Germany

Filed Jan. 22, 1991, Ser. No. 643,991

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1990, 4001733

Int. Cl.[5] **B41F** *31/04, 31/06;* **B41L** *27/08*

U.S. Cl. 101—363 **8 Claims**



1. A doctor device for a self-washing inking unit of a rotary printing press, comprising:

an inking roller,

a sealing means,

a doctor carrier,

two doctor blades, parallel to each other and able to be brought into engagement with said inking roller, attached to the doctor carrier, said doctor blades, together with the inking roller, the doctor carrier and said sealing means provided terminally on each end of the doctor carrier, defining a closed ink chamber,

ducts for the supply of ink to and removal of ink from the ink chamber, and

loading means for pressing the doctor carrier against the inking roller,

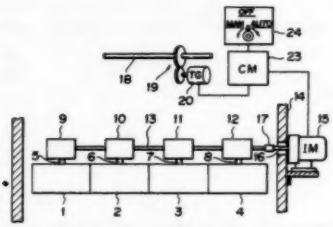
wherein the sealing means are formed of moldings of elastic material provided with an aperture filled with a member of soft elastic material and, at a side facing the inking roller, each molding having downwardly sloping, dihedral sealing surfaces for receiving terminal parts of the doctor blades and between which there is a respective curve for a roller sealing surface, which is able to engage the inking roller, each said roller sealing surface having the form of a cylindrical shell with a radius of curvature corresponding to the radius of the inking roller.

5,182,993

INK SUPPLY SOURCE DRIVING APPARATUS FOR ROTARY PRESSES

Noriyuki Shiba, Tokyo, and Mamoru Hayashi, Kawasaki, both of Japan, assignors to Tokyo Kikai Seisakusho, Ltd., Tokyo, Japan

Continuation of Ser. No. 484,790, Feb. 23, 1990, abandoned. This application Oct. 24, 1991, Ser. No. 782,785
Claims priority, application Japan, Mar. 2, 1989, 1-48619
Int. Cl.[5] B41F *31/08*
U.S. Cl. 101—365 **1 Claim**



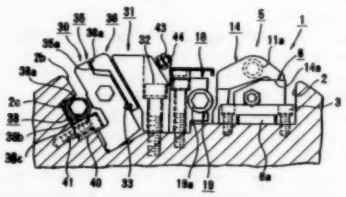
1. An ink supply source driving apparatus for driving a plurality of ink pumps in a rotary press, comprising: a synchronizing signal generator having means for generating a signal synchronous with the rotation of a driving system of said rotary press, an ink pump driving motor which comprises an inverter control motor having an output shaft, a common drive shaft coupled directly to said output shaft, a plurality of clutches coupled to be driven by said common drive shaft, each of said clutches having means for being engaged and disengaged separately and each of said clutches being operatively coupled for driving one of said ink pumps, a control unit having means for operating said ink pump driving motor selectively in a first control mode wherein said ink pump driving motor is driven by an output from said synchronizing signal generator synchronously with and at a predetermined rotational ratio with respect to the rotation of said rotary press driving system and a second control mode wherein said ink pump driving motor is driven independently of the rotation of said rotary press driving system, and a change-over means for selectively switching control modes of said control unit between said first control mode and said second control mode.

5,182,994

PLATE LOCKUP APPARATUS FOR SHEEET-FED PRESS

Hiroyuki Sugiyama, Ibaraki; Toshio Miyamoto, and Kazuhiro Maejima, both of Chiba, all of Japan, assignors to Komori Corporation, France

Division of Ser. No. 561,687, Aug. 1, 1990, Pat. No. 5,094,165. This application Nov. 1, 1991, Ser. No. 786,533
Claims priority, application Japan, Aug. 4, 1989, 1-201276; Aug. 21, 1989, 1-213096; Dec. 6, 1989, 1-315381
The portion of the term of this patent subsequent to Mar. 10, 2009, has been disclaimed.
Int. Cl.[5] B41F *27/06*
U.S. Cl. 101—415.1 **5 Claims**



1. In combination with a printing press of the type having a plate cylinder with a peripheral surface having a gap therein and a plate mounted to said peripheral surface of said plate cylinder, said plate having a leading edge and a trailing edge received in said gap, the improvement comprising:

a leading-side lockup device located in said gap of said peripheral surface of said plate cylinder for gripping said leading edge of said plate;

a trailing-side lockup device located in said gap of said plate cylinder for gripping said trailing edge of said plate, said trailing-side lockup device having a lockup table and a gripper plate juxtaposed thereto, said lockup table and said gripper plate having opposing plate gripper surfaces extending in a substantially radial direction of said plate cylinder, said lockup table and said gripper plate being pivotable relative to each other; and

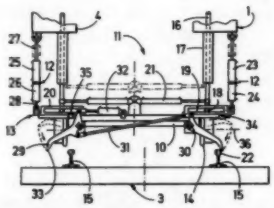
camming means having a cam surface adapted to contact said lockup table of said trailing-side lockup device, said camming means having a first predetermined position wherby both said plate gripper surfaces of said lockup table and said gripper plate are pivoted to contact one another to grip said plate, said camming means further having a second predetermined position whereby said lockup table and said gripper plate are moved concurrently in a substantially circumferential direction of said plate cylinder to tighten said plate on said peripheral surface of said plate cylinder.

5,182,995

RERAILING DEVICE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 10, 1992, Ser. No. 848,850
Claims priority, application Austria, Apr. 29, 1991, 889/91
Int. Cl.[5] E01B *35/00*
U.S. Cl. 104—2 **11 Claims**



1. A device for rerailing a tool frame having first and second flange wheels onto the rails of a track, said tool frame being movably connected to a machine frame of a track-laying machine, said rerailing device comprising

first and second lever means mounted directly on said tool frame for abutting against said rails,

swivel drive means for swivelling said first and second lever means in a plane extending perpendicular to the longitudinal direction of the track thereby causing said tool frame to be centered between said rails with said flange wheels directly above said rails, and

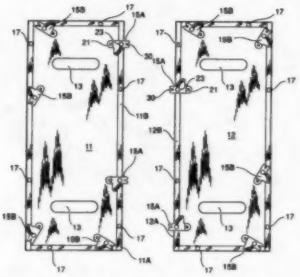
first and second two-stage height drive means for lowering said tool frame froms aid machine frame in a first stage wherein said first and second lever means and said swivel drive means cause said tool frame to be centered between said rails, and in a second stage wherein, after said tool frame has been centered between said rails, said flange wheels are lowered onto said rails.

5,182,996

PIVOTING BRACKET ASSEMBLY FOR CONNECTING TABLE TOPS

David R. Gutgsell, Jasper, Ind., assignor to Ditto Sales, Inc, Jasper, Ind.

Filed Oct. 30, 1991, Ser. No. 784,760
Int. Cl.[5] A47B *57/00*
U.S. Cl. 108—64 **19 Claims**



1. An apparatus for the interconnection of two or more table tops, a first such table top having an underside bounded by a plurality of edges, and a second such table also having an underside bounded by a plurality of edges, said apparatus comprising:

a brakcet having a pivot end and a connection end, and defining a first slot between said pivot end and said connection end, said first slot having a first end and a second end, said bracket further defining a second slot at said connection end of said bracket;

mounting means for mounting said bracket to the underside of a first table top, said mounting means including;

first fastener means for pivotably fastening said pivot end of said bracket to the underside of the first table top for pivoting said bracket in a plane parallel to the underside of the table top; and

second fastener means engagable to the underside of the first table top and extending through said first slot for fastening said bracket to the table top at said first slot,

whereby when said bracket is mounted to the first table top said bracket is pivotable about said first fastener means between a first position in which said second fastener means is located at said first end of said first slot and said bracket is oriented with said second slot extending beyond an edge of the first table, and a second position in which said second fastener means is located at said second end of said first slot and said bracket is positioned substantially completely under the first table top; and

third fastening means for clamping said bracket at said second slot to the underside of a second table top when said bracket is in said first position and one edge of each of the table tops is abutting.

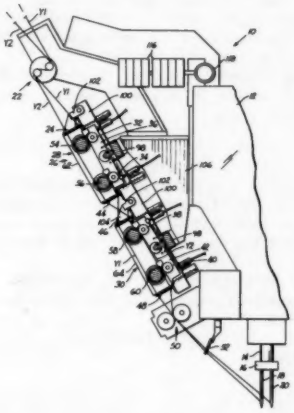
5,182,997

TUFTING MACHINE YARN FEED ROLLER ASSEMBLY

Harold B. Bardsley, Nr. Chorley, England, assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed Nov. 4, 1991, Ser. No. 787,063
Int. Cl.[5] D05C *15/18*
U.S. Cl. 112—80.73 **20 Claims**

1. A yarn feed roller assembly for a tufting machine comprising a plurality of drive rollers rotatably mounted transversely on said tufting machine and driven thereby at different respective speeds, a multiplicity of transversely spaced control arms, a plurality of yarn feed rollers each corresponding to a drive roller rotatably journalled on each control arm, support means for pivotably mounting each control arm adjacent said drive rollers for engagement of said feed rollers with a respective drive roller selectively, and means for selectively pivoting said control arms to frictionally engage a selected feed roller of each control arm with a respective drive roller for rotatably driving said selected feed roller of each control arm by the



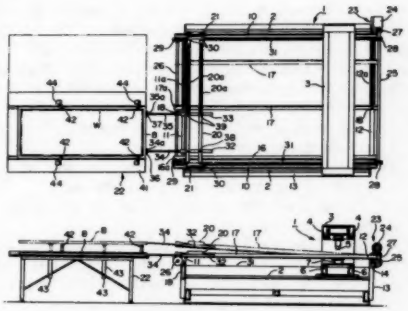
respective drive roller, whereby a yarn guided between the feed rollers of each control arm and the drive rollers will be frictionally engaged by and fed by the selected feed roller and its respective drive roller at a corresponding speed.

5,182,998

APPARATUS FOR MOUNTING AND REMOVING THE SUPPORTING FRAME OF A QUILT OR THE LIKE IN SEWING MACHINES

Yukio Iwase, Utsunomiya, Japan, assignor to Prince Corporation, Tokyo, Japan

Filed Oct. 17, 1991, Ser. No. 779,407
Claims priority, application Japan, Oct. 23, 1990, 2-284691
Int. Cl.[5] D05B *11/00*
U.S. Cl. 112—117 **2 Claims**



1. An apparatus for mounting and removing a supporting frame of a quilt in sewing machines, comprising:

a pair of left and right guide rails wherein one end pivots on one side of a sewing machine, the guide rails provided as a fulcrum, allowing the guide rails to be moved in a circular fashion, and are arranged in parallel with each other;

a pair of left and right supporting rails wherein one end pivots with the pair of left and right guide rails, the left and right supporting rails pivoting as a fulcrum to permit circular movement, and are arranged in parallel with the

guide rails, that slide and support the supporting frame of the quilt;

an apparatus for moving up and down to produce circular motion of the guide rails which pivot as a fulcrum, and which urges these guide rails and a second end of the supporting rail to move up and down;

a moving member, articulated to the guide rails;

a moving apparatus, which moves the moving member along the pair of guide rails; and

anchoring members, which are interconnected with the moving member, to anchor the moving member to the supporting frame.

5,182,999

SEWING MACHINE FEEDER DRIVE AND STITCH-LENGTH ADJUSTMENT MECHANISM

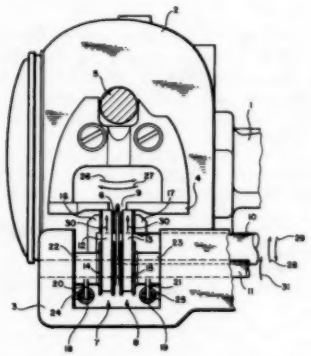
Rudolf Dietl, Munich, Fed. Rep. of Germany, assignor to J. Strobel & Sohne GmbH & Co., Munich, Fed. Rep. of Germany

Filed Oct. 15, 1991, Ser. No. 775,904

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1990, 4032813

Int. Cl.[5] D05B *1/24*

U.S. Cl. 112—178 **14 Claims**



1. A sewing machine having a sewing area and feeder means for advancing material being sewn through said sewing area in a stepwise manner, said sewing machine comprising:

A. means for moving said feeder means intermittently in the direction in which said material being sewn is advanced, said moving means including:

a drive shaft pivotable to-and-fro and provided with a radially projecting drive crank;

an output shaft extending parallel to said drive shaft and drivingly connected to said feeder means;

an output crank pivotable about an axis parallel to said output shaft;

a linkbar interconnecting said drive crank and said output crank at two pivot axes parallel to said output crank pivot axis, said linkbar having an effective length equal to the effective length of the drive crank; and

means for transmitting motion of said output crank to said output shaft; and

B. means for adjusting the stitch-length of said sewing machine, said stitch-length adjusting means including:

means for supporting said output crank pivotably, said supporting means being rotatably supported on said output shaft and being provided with said motion transmitting means; and

means for rotating said supporting means on said output shaft, whereby said output crank pivot axis is displaced with respect to said drive shaft to set the length of each motion of said feeder means and hence the stitch-length of said sewing machine.

5,183,000

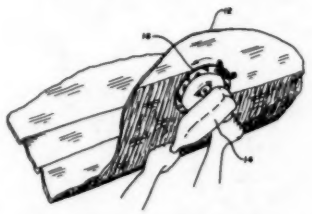
METHOD FOR CLEANING BOAT HULLS

Lonnie R. Burks, P.O. Box 112, New Blaine, Ark. 72851

Filed Feb. 18, 1992, Ser. No. 846,244

Int. Cl.[5] B63B *59/08*

U.S. Cl. 114—222 **2 Claims**



1. A method for cleaning while out of the water a boat hull having surface areas above and below a water line, comprising the steps of:

affixing an industrial grade synthetic fiber scouring pad to a flexible backup pad having a driving shaft;

attaching a scouring assembly comprising said scouring pad and said backup pad to a portable, hand-operated power tool having means for engaging a driving shaft by engaging said driving shaft with said means for engaging a driving shaft;

removing the boat hull from the water;

allowing sufficient time for the boat hull to dry;

applying a pumice hand cleaner to the surface area of the boat hull below the water line;

applying a cream hand cleaner to the surface area of the boat hull above the water line;

driving said scouring assembly in a rotary motion with said power tool at low speed while applying said scouring pad to the surface areas of the boat hull until the boat hull is clean; and

rinsing the boat hull.

5,183,001

FLOAT

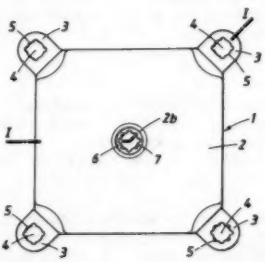
Margarete Stranzinger, Gitzen 16, A-5322 Hof bei Salzburg, Austria

Filed Aug. 22, 1991, Ser. No. 748,640

Claims priority, application Austria, Aug. 23, 1990, 1734/90

Int. Cl.[5] B63B *3/08*

U.S. Cl. 114—266 **9 Claims**



1. A float comprising

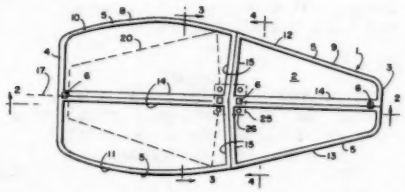
a generally prismatic-shaped body with a plurality of corners,

a connecting element attached to each of said plurality of corners and extending generally horizontally outwardly

from said body and having an eye passing vertically through said connecting element and a bottom surface with a recess adjoining said eye, said connecting elements being vertically offset from each other, and

a bearing ring located in a central retaining opening in the middle of said body, said opening passing vertically through said body, said bearing ring having a bottom surface with a recess adjoining the open interior of said ring, wherein said eye of said connecting element has a cross sectional shape which is the same as the cross sectional shape of the opening of said bearing ring.

5,183,002
FOLDING AND NESTING BOAT
Corvin L. Parker, 5824 Urdea Rd., Jupiter, Fla. 33458
Filed Feb. 14, 1992, Ser. No. 835,353
Int. Cl.[5] B63B *3/00*
U.S. Cl. 114—353 **15 Claims**



1. A boat having an open condition for operation and a folded and nested closed condition for transport and storage, said boat comprising:

A) a boat hull having rigid sides, a substantial length along a centerline, and a width less than said length when said boat is in an open condition;

B) said hull being divided into a plurality of separate transverse sections by at least one separation plane, said at least one separate plane being disposed transverse to said centerline;

C) each said transverse section being divided into a separate, rigid, port portion and a separate, rigid, starboard portion, each said portion having at least one rigid side and a bottom;

D) hinge means pivotally joining each said port portion to a corresponding said starboard portion for pivoting about a pivot axis that extends along said centerline, wherein said port portion is foldable against said starboard portion to yield a width substantially less than the width thereof when in open, unfolded condition;

E) said transverse sections being constructed so that said transverse sections, when folded, are nestable together within one another to provide a total closed package of said hull when in said closed condition that has an overall length and width that are both substantially less than the length and width of said hull when in said open condition; and

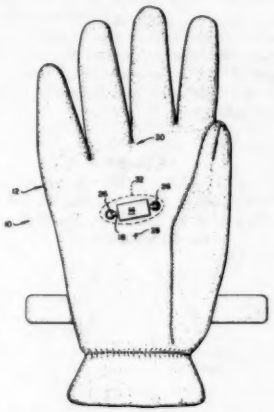
F) fastening means for securing said port and starboard portions together in unfolded condition and for securing said sections together in open condition to thereby provide a rigid hull.

5,183,003
HANDWORN MECHANISM FOR SIGNALLING BY SCUBA DIVERS
Bruce W. Powell, and Judith F. Powell, both of 1442 G St., Woodbridge, Va. 22191
Filed Dec. 11, 1991, Ser. No. 804,724
Int. Cl.[5] B63B *45/08;* **H04B** *11/00*
U.S. Cl. 116—26 **20 Claims**

1. A hand worn mechanism used in scuba diving by an underwater user wearing an air tank for producing a sound using the air tank as a percussive instrument comprising:

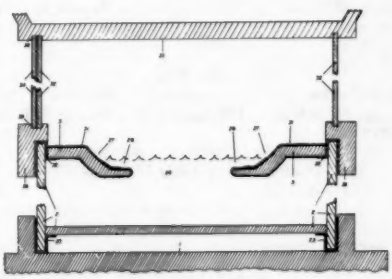
a flexible article worn on a hand of the user which extends at least across a portion of a palm of the hand;

a hard striker; and



a mounting means for mounting said strike to said flexible article adjacent the palm of the user and with at least a top portion of said striker exposed whereby the user easily produces a percussive sound by direct striking of the air tank worn by the user with said striker worn on the hand of the user.

5,183,004
SELF CONTAINED VIVARIUM
Lane Trent, 460 17 Street, and Gua-Ming Shau, 151 18 Street, both of Brooklyn, N.Y. 11215
Continuation of Ser. No. 545,206, Jun. 28, 1990, abandoned. This application Sep. 20, 1991, Ser. No. 762,257
Int. Cl.[5] A01K *63/00*
U.S. Cl. 119—5 **8 Claims**



1. A self contained ecosystem comprising, a lower cabinet with a top surface and bottom surface, said cabinet including at least one door between the top and bottom surfaces,

a lower section vivarium/aquarium with first upper and lower frame members supporting a plurality of transparent walls therebetween, a bottom floor section positioned on a ledge of said lower frame member, said lower frame member positioned above the top surface of said cabinet,

said upper frame member having an inner rim extending inwardly towards the middle of the lower section vivarium/aquarium, a rigid landplate is supported on top of said inner rim, said landplate has a dry area and a wet area, said

wet area extends downwardly below said inner rim forming a shallow section of water and providing a means of which amphibians can climb out onto the dry landplate area,

said vivarium/aquarium also includes an upper section with second upper and lower frame members support a plurality of transparent walls therebetween said second lower frame member is supported on top of the first upper frame member, at least one opening in the upper section's transparent walls to facilitate a door closure means that provides access into said upper section,

a roof supported on the second upper frame to enclose the vivarium/aquarium, said roof having apertures for ventilation and lighting.

5,183,005

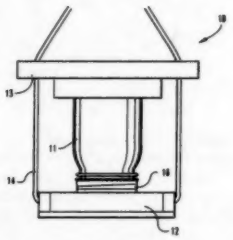
FLIP-FLOP BIRD FEEDER

Thomas L. Tyler, 2896 E. 276th St., Atlanta, Ind. 46031

Filed Mar. 12, 1992, Ser. No. 849,941

Int. Cl.[5] A01K *39/00*

U.S. Cl. 119—52.2 **4 Claims**



1. A bird feeder, comprising:

(a) a jar for holding bird seed, said jar having a mouth;

(b) a trough;

(c) means for positioning the mouth of said jar directly over said trough so that seed may flow from the jar into the trough;

(d) means for directly suspending said trough from a support;

(e) means for holding said jar in a generally mouth-downward orientation when the jar is positioned over said trough suspended by said suspending means, wherein said holding means is slideably received on said suspending means.

5,183,006

DISPENSING LIQUID ANIMAL PICK APPLICATOR

Maureen G. Robinson, 428 Beacon St., Chestnut Hill, Mass. 02167

Filed Jan. 27, 1992, Ser. No. 826,489

Int. Cl.[5] A01K *13/00*; **A45D** *24/22*; **B43K** *5/14*

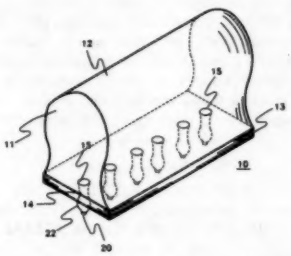
U.S. Cl. 119—85 **4 Claims**

1. A disposable applicator for dispensing liquid formulations to the undercoat and skin of animals comprising;

a flexible, compressible handle section that can be easily compressed by the user's hand to control the amount and flow rate of the liquid formulation to be applied, such that the entire handle section can be compressed;

a rigid, substantially rectangular manifold section, attached to said handle section to form a substantially hermetically sealed reservoir of sufficient volume to hold an efficacious amount of liquid formulation within said reservoir until time of dispensing, such that once reservoir dispenses with liquid formulation it cannot be refilled;

a plurality of applicator prongs, attached to said manifold section, arranged in a single row, with each of said prongs having a bulbous tip, adapted in shape to easily and comfortably penetrate said animal's coat, with each said bulbous tip having at le st one fluid delivery port, and with each of said prongs having a closure protuberance integral with said prong, such that said liquid formulation is prevented from flowing from said applicator prongs, and



when said closure protuberance is removed by cutting off from said prong, said liquid formulation flows from said delivery port corresponding to the pressure exerted on said handle section by said user.

5,183,007

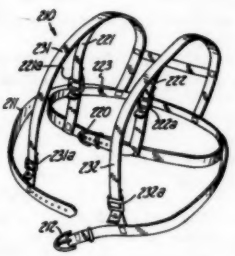
MOTORCYCLE SAFETY HARNESS

John Vincent, 106 15th Ave. NE., Minot, N. Dak. 58701

Filed May 15, 1990, Ser. No. 524,171

Int. Cl.[5] A62B *35/00*; **B62J** *23/00*

U.S. Cl. 119—96 **5 Claims**



1. A motorcycle safety harness for use by a child riding with an adult, said harness comprising:

a first harness portion which comprises a first unitary belt having a length sufficient to extend around the combined waists of the child and the adult and having a single fastener positioned at a forward side of the adult, opposite from the child; and

a second harness portion which encloses the upper body portion of the child and comprises a second belt which is secured around only the waist of the child and a pair of straps that extend from the second belt on the rear side of the child, over the shoulders of the child to the second belt on the forward side of the child, said second harness portion being secured to said first belt.

5,183,008

LIVESTOCK SORTING SYSTEM HAVING IDENTIFICATION SENSOR AND GATE MOUNTED EXIT SWITCH

James A. Carrano, Stoughton, Wis., assignor to DEC International, Inc., Madison, Wis.

Filed Feb. 11, 1991, Ser. No. 653,762

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—155 **13 Claims**

1. A livestock sorting system comprising:

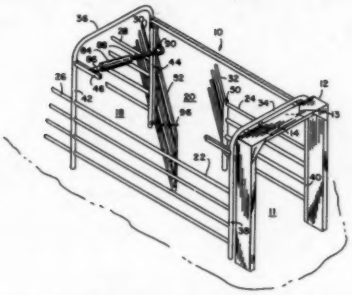
an entrance having an identification sensor for identifying designated livestock passing therethrough;

a first aisle extending from said entrance;

a second aisle extending from said entrance, said first and second aisles converging at a junction having an upstream end and a downstream end;

a gate having a first position providing communication of said entrance with said first aisle and blocking communication of said entrance with said second aisle, and having a second position providing communication of said entrance with said second aisle and blocking communication of said entrance with said first aisle, said gate being a pivoted member having a hinged downstream end pivoting on a vertical axis at said downstream end of said junction, said gate having an upstream end swingable in an arc across said upstream end of said junction;

an actuator actuating said gate between said first and second positions;



an automatic control for automatically controlling actuation of said gate by said actuator between said first and second positions in response to said identification sensor, said actuator actuating said gate to said second position in response to identified designated livestock passing through said entrance;

an exit switch in said second aisle and responsive to livestock passing through said second aisle to trigger said actuator to actuate said gate from said second position to said first position, said exit switch being spaced downstream from said swingagble upstream end of said gate by a given distance such that the rear of the livestock animal is about even with said swingable upstream end of said gate as said gate swings from said second position to said first position,

wherein said exit switch is mounted to said gate at a location spaced downstream from said swingable upstream end of said gate by a distance substantially the same as the length of the livestock animal's body, excluding head and neck.

5,183,009

MECHANIZED ANIMAL LITTER APPARATUS AND METHOD OF OPERATING

Emanuel T. Vito, 685 Avenue "C" , Stroudsburg, Pa. 18360

Filed Feb. 5, 1991, Ser. No. 650,900

Int. Cl.[5] A01K *1/01*

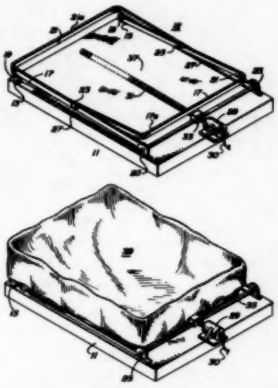
U.S. Cl. 119—165 **27 Claims**

1. A sanitary collection and disposal apparatus for animal litter comprising:

(a) a horizontally extended base, arranged and constructed to be supported by and substantially parallel to a general supporting surface and to serve as a stabilizing support for an animal litter bag handling mechanism,

(b) at least two cooperating litter bag support arms having upper and lower ends one of which arms is pivotally attached to one end of the base at the lower end of said arm and which arms are pivoted at least indirectly to each other for movement of their upper and lower ends toward and away from each other,

(c) a friction-reducing means positioned at the lower end of said other litter bag support arm, which is not pivotally attached to the base, said friction reducing means being arranged and constructed to move in supporting contact with a surface of the base, over the mechanical range of movement of the pivoted together arms, and



(d) litter bag support surface means at the upper end of said cooperating litter bag support arms with which the upper portions of litter bags may be engaged.

5,183,010

ADDITIVE FOR BINDING LIQUID WASTE

Marvin L. Raymond; Dana G. Barrett, both of Cape Girardeau, and Phillip B. Greene, Sikeston, all of Mo., assignors to Golden Cat Corporation, South Bend, Ind.

Filed Jan. 28, 1992, Ser. No. 826,800

Int. Cl.[5] A01K *1/015*

U.S. Cl. 119—172 **28 Claims**

1. A litter composition capable of agglomerating upon contact with a liquid that is deposited in the composition to facilitate removal of the liquid from a container containing the litter composition, comprising:

a particulate liquid absorbent material;

a particulate polymer having a hydroxyl group content sufficient to enable the composition to agglomerate into a mass upon contact with a liquid; and

an accelerator in an amount sufficient to accelerate hardening of the mass;

said mass being of sufficient cohesive strength to permit removal of said mass from the container.

5,183,011

METHOD OF CONTROLLING THE SUPPLY OF FUEL IN HYDROGEN-FUELED ENGINE

Isao Fujii; Yoshio Ajiki; Yoichi Ishida, and Hiromi Matsuura, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1992, Ser. No. 870,543

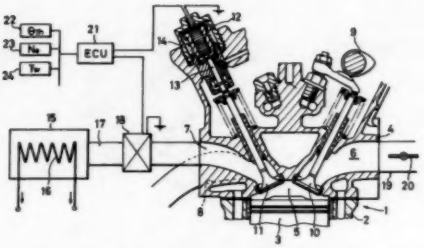
Claims priority, application Japan, Apr. 17, 1991, 3-85489

Int. Cl.[5] F02B *75/12*

U.S. Cl. 123—1 A **7 Claims**

1. A method of controlling the supply of fuel in a hydrogen-fueled engine having an intake valve, a hydrogen supply valve and an exhaust valve with each of said valves being operated to open and close relative to a combustion chamber, and a control valve provided in a hydrogen supply pipe to control an output of said engine through control of a flow amount of hydrogen, said control valve being a pressure control valve for adjusting the pressure of hydrogen to be supplied, said hydrogen supply valve being operated by means capable of adjusting lift and valve timing of the hydrogen supply valve, wherein said

method is characterized in that the amount of hydrogen being supplied to said combustion chamber is controlled based on control signals corresponding to load conditions by both said



pressure control valve and said hydrogen supply valve under at least one of a low-load condition and a high-load condition, and substantially only by said pressure control valve under an intermediate-load condition.

5,183,012

THERMOSTATIC VALVE

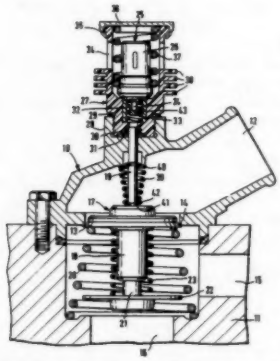
Roland Saur, Stuttgart; Friedrich Bauer, Kornwestheim, and Joachim Rothenpieler, Wolfsburg, all of Fed. Rep. of Germany, assignors to Behr-Thomson-Dehnstoffregler GmbH & Co., Fed. Rep. of Germany

Filed Feb. 19, 1992, Ser. No. 836,879

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1991, 9102294[U]

Int. Cl.[5] F01P *7/14*

U.S. Cl. 123—41.08 **20 Claims**



1. A thermostatic valve for a coolant control of an internal-combustion engine, comprising:

a valve housing made of a metal,

a first thermostatic working element assigned to engine coolant flow and having a first working piston movable in response to temperature changes in the coolant flow to control a coolant flow control valve in the valve housing,

and a second thermostatic working element arranged outside the coolant flow in fluid communication with an ambient air space and having a second working piston movable in response to temperature changes in the ambient air space temperature, said second working piston supporting an abutment member operatively engageable by the first working piston to thereby control the operating position of the first working piston as a function of the ambient air space temperature,

wherein the second thermostatic working element is thermally separated from the coolant and from elements coming in contact with the coolant,

and wherein a connecting element having a lower thermal conductivity in comparison to said metal of said valve housing is arranged between the valve housing and the second thermostatic working element to assist in thermally separating the same from the coolant.

5,183,013

TWO-CYCLE DIESEL ENGINE

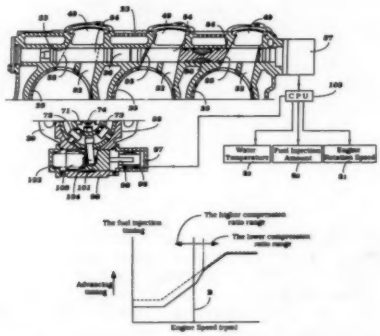
Hideaki Ito, and Masanori Miyamoto, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 28, 1990, Ser. No. 590,003

Claims priority, application Japan, Sep. 29, 1989, 1-253929

Int. Cl.[5] F02B *75/04*

U.S. Cl. 123—48 R **20 Claims**



1. A fuel injection system for a diesel engine including means for increasing the compression ratio under low and mid-range speed and load conditions, means responsive to engine speed for retarding the beginning the fuel injection in response to an engine speed reduction, and means for further changing the running condition in response to a change of compression ratio for lowering combustion chamber temperatures and precluding the formation of nitrous oxide.

5,183,014

SLEEVE VALVE SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING ELLIPTICAL PATH

Gregory S. Stevenson, 1830 N. Sierra Madre Villa, Pasadena, Calif. 91107

Division of Ser. No. 361,450, Jun. 5, 1989, Pat. No. 5,088,285. This application Oct. 18, 1991, Ser. No. 779,382

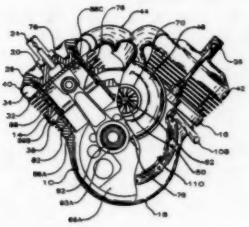
Int. Cl.[5] F02B *75/20*

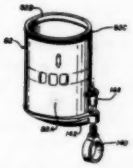
U.S. Cl. 123—59 AC **3 Claims**

1. In an internal combustion engine including a plurality of cylinders, a crankcase, a crankshaft, a piston in each cylinder and a connecting rod connecting each piston to said crankshaft, an intake manifold and an exhaust manifold and sleeve valves within each cylinder for opening and closing communication between each cylinder and the intake and exhaust manifolds wherein each of said sleeve valves includes an enlarged head wall thickness region in the compression end of its cylinder, said enlarged head wall thickness region defining a sealing ring retaining recess and presenting a surface to expanding gases to provide a valve opening force during the power stroke of the cylinder;

a sealing ring in said sealing ring retaining recess; and

including means for driving said sleeve valves in an elliptical path during movement;





said sleeve valve driving means comprising planetary gear and eccentric drive system for each cylinder coupled to said crankshaft.

5,183,015

VALVE OPERATING APPARATUS

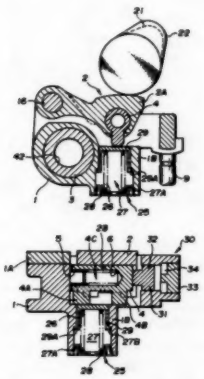
Shoji Morita; Yoshihiko Yamada, and Seinosuke Hara, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Apr. 24, 1992, Ser. No. 873,362

Claims priority, application Japan, Apr. 26, 1991, 3-097238

Int. Cl.[5] F01L *1/34*

U.S. Cl. 123—90.16 **6 Claims**



1. An apparatus for operating a valve, comprising:

a first cam;

a second cam;

a rocker arm for the valve and operated by said first cam, said rocker arm having a predetermined part having a lost motion mechanism;

a free cam follower pivoted to said rocker arm and operated by said second cam;

a prop slidably received by said free cam follower for movement between a first position in which said prop supports said free cam follower on said lost motion mechanism and a second position in which said prop supports said free cam follower on said predetermined part; and

means adapted for shifting said prop between said first and second position.

5,183,016

HYDRAULIC VALVE CLEARANCE COMPENSATOR

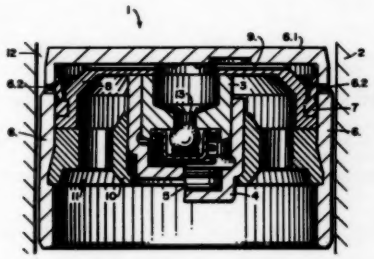
Volker Budde, Kandelgasse, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Apr. 1, 1992, Ser. No. 861,745

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1991, 4124484

Int. Cl.[5] F01L *1/24, 1/14*

U.S. Cl. 123—90.55 **12 Claims**



1. In a hydraulic valve clearance compensator for an internal combustion engine, with a housing shaped essentially like an upside down cup with a flat base, sliding up and down inside a central bore, accommodating two concentric hollow cylinders sealed off from each other and separated by an axially resilient compression spring, and with at least one inlet in its wall that supplies lubricant to one cylinder, and with a check valve arranged between the inlet and the cylinders that allows lubricant to flow through the inlet into the cylinders but prevents it from flowing out, the improvement wherein at least the section of the housing between the inlet and the base is narrower than the rest of the housing.

5,183,017

AIR FILTER DEVICE FOR AN INTERNAL-COMBUSTION ENGINE

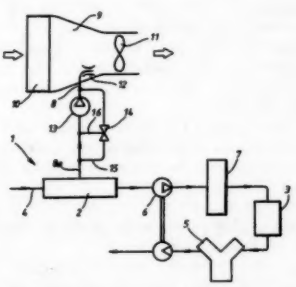
Stefan Bopp, Easlingen, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Feb. 19, 1992, Ser. No. 836,760

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1991, 4109406

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 D **9 Claims**



1. Air filter device for an internal-combustion engine of the type including a charge-air compressor, a charge-air cooler, a

water-air heat exchanger and a motor-driven blower with a blower hood which directs air from the heat exchanger to the blower, the air filter device comprising:

a dust precipitator and a dry air filter in an internal-combustion engine intake line,

a dust extraction blower in a dust exhaust-air line connected to the dust precipitator,

an additional exhaust-air line in addition to the dust exhaust-air line which is connected to an intake side of the motor-driven blower,

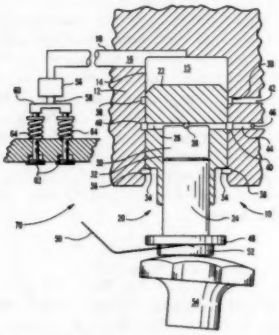
a shut-off element in the additional exhaust-air line, and a shut-off element opening system for opening the shut-off element in the event of failure of the dust extraction blower.

5,183,018

MASTER CYLINDER WITH TWO-PIECE MASTER PISTON

David A. Vittorio, Columbus, and Steven W. Reedy, Nashville, both of Ind., assignors to Cummins Engine Co., Inc., Columbus, Ind.

Filed Mar. 24, 1992, Ser. No. 856,579
Int. Cl.[5] F02D *13/04*
U.S. Cl. 123—321 **19 Claims**



1. A master cylinder for use in conjunction with an engine compression braking system having an hydraulically activated slave cylinder, said master cylinder comprising:

cylinder means having a bore therein and wherein said bore is in fluid communication with said slave cylinder;

telescoping piston means inserted into said bore for providing a force to a fluid within said bore, said telescoping piston means including a piston fluid port in fluid communication with an internal chamber of said piston means, wherein pressurized fluid supplied to said internal chamber extends said telescoping piston to a predetermined elongated length;

means for supplying pressurized fluid to said piston fluid port when said telescoping piston is in a first position thereby expanding said telescoping piston to said predetermined elongated length;

means for releasing fluid from said internal chamber when said telescoping piston means is moved into said bore a predetermined distance; and

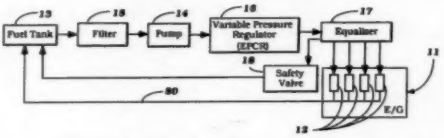
actuator means contacting said telescoping piston means for displacing said telescoping piston means into said bore in response to the occurrence of a predetermined cyclical event in the operation of the engine.

5,183,019

IDLING CONTROL DEVICE FOR HIGH PRESSURE FUEL INJECTION ENGINE

Hidenori Suhara, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 3, 1991, Ser. No. 725,552
Claims priority, application Japan, Jul. 5, 1990, 2-178896
Int. Cl.[5] F02D *41/16*
U.S. Cl. 123—339 **14 Claims**



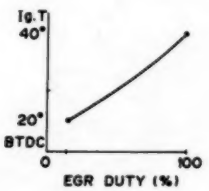
1. A high pressure fuel injection system for a diesel type internal combustion engine comprising an accumulator type fuel injector for spraying a quantity of fuel stored in the accumulator into said engine, pressure control means for controlling the pressure of the fuel supplied to said fuel injector, duration control means for controlling the timing of the discharge of said injector, means for sensing engine speed, means for sensing when an idle condition of the engine is called for by the engine, and means for maintaining a predetermined idle speed by holding one of the pressure control means and duration control means constant and varying the other of the control means.

5,183,020

IGNITION TIMING CONTROL APPARATUS FOR ENGINE

Keiji Hosoi, Shizuoka, Japan, assignor to Suzuki Motor Corporation, Shizuoka, Japan

Filed Oct. 11, 1991, Ser. No. 775,819
Claims priority, application Japan, Oct. 31, 1990, 2-294463
Int. Cl.[5] F02P *5/145*; F02M *25/07*
U.S. Cl. 123—406 **2 Claims**



1. In an engine including an intake passage, an exhaust passage, and an exhaust gas recirculation means for recirculating a selected amount of exhaust gas from said exhaust passage back to said intake passage, the improvement comprising:

means responsive to said exhaust gas recirculation means for setting an ignition timing of the engine to first and second ignition timing settings in response to recirculation of respective minimum and maximum amounts of exhaust gas; and

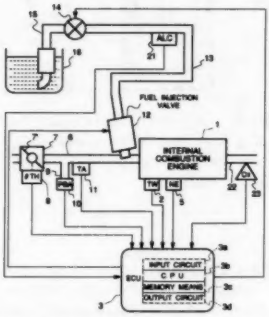
means responsive to said exhaust gas recirculation means for setting the ignition timing to a third ignition timing setting in response to recirculation of a third amount of exhaust gas which is greater than said minimum amount but less than said maximum amount, including interpolation means for obtaining said third ignition timing setting by interpolating between said first and second ignition timing settings based on the relationship which said third amount of exhaust gas bears to said minimum and maximum amounts of exhaust gas.

5,183,021

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Toshiyuki Suga; Shinichi Kitajima, both of Wako, and Yoshihiko Kobayashi, Tochigi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1992, Ser. No. 858,738
Claims priority, application Japan, Mar. 28, 1991, 3-64724
Int. Cl.[5] F02D *41/14*
U.S. Cl. 123—478 **3 Claims**



1. In an air-fuel ratio control system for an internal combustion engine using fuel containing alcohol, said system having correcting means for correcting an amount of fuel supplied to said engine by a correction amount when said engine is in a predetermined high load region, said correction amount being dependent on load on said engine,

the improvement comprising:

alcohol concentration-detecting means for detecting concentration of alcohol in said fuel; and

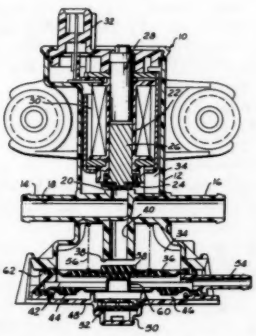
correction amount-changing means for decreasing said correction amount to a smaller value as the detected concentration of alcohol in said fuel is higher.

5,183,022

MULTI-SLOPE CANISTER PURGE SOLENOID VALVE

John E. Cook, Chatham, Canada, assignor to Siemens Automotive Limited, Chatham, Canada

Filed Jul. 16, 1991, Ser. No. 730,728
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—520 **12 Claims**



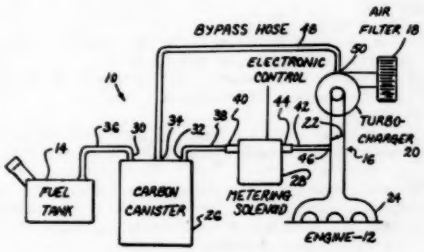
1. In an automotive internal combustion engine canister purge system wherein a canister purge solenoid (CPS) valve has an inlet connected to a canister that is to be purged of collected fuel vapors, an outlet connected to intake manifold vacuum, a flow path between said inlet and said outlet which includes a solenoid-controlled valve and a diaphragm-controlled valve, in that order, between said inlet and said outlet, said diaphragm-controlled valve comprising diaphragm means having one face disposed for valved communication with said outlet and another face disposed for communication with atmosphere characterized in that said diaphragm means comprises two diaphragms that are separated by a chamber space, one of said diaphragms containing said one face and the other of said diaphragms containing said another face, and said chamber space is communicated to intake manifold vacuum.

5,183,023

EVAPORATIVE EMISSION CONTROL SYSTEM FOR SUPERCHARGED INTERNAL COMBUSTION ENGINE

John D. Hanson, Bloomfield Hills, Mich., assignor to Siemens Automotive Limited, Ontario, Canada

Filed Nov. 1, 1991, Ser. No. 786,487
Int. Cl.[5] F02M *33/02*
U.S. Cl. 123—520 **2 Claims**

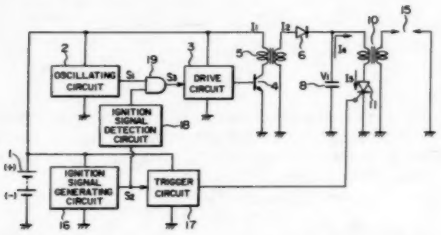


1. An on-board evaporative emission control system of an automotive vehicle having a tank for storing volatile fuel which is used to power the vehicle, an internal combustion engine having combustion chamber space within which fuel supplied from said tank is combusted with air that has passed from atmosphere into the combustion chamber space through an air intake system which comprises a supercharger and a throttle arranged such that said supercharger is disposed upstream of said throttle, said supercharger being selectively operable to at some times create superatmospheric pressure in that portion of the intake system downstream of the supercharger while at other times allowing the operation of the engine to create subatmospheric pressure in that portion of the intake system downstream of the supercharger, said evaporative emission control system comprising a vapor collection canister having an inlet port, an outlet port, and a vent port and being constructed and arranged to allow flow in either direction between said vent port and said outlet port, means communicating said inlet port to headspace of said tank so that fuel vapors can enter and be collected in the canister, and means including purge control valve means communicating said outlet port with said intake system at a location which is downstream of said throttle, characterized by means communicating said vent port to said intake system at a location which is upstream of said supercharger such that when the pressure in the intake system downstream of the supercharger is subatmospheric, the canister purge flow is from the canister outlet port to the intake system and is controlled by said purge control valve, and when the pressure in the intake system downstream of the supercharger is superatmospheric, the canister purge flow is from the canister vent port to the intake system and is controlled by said purge control valve.

5,183,024
IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE

Shingo Morita, and Mitsuru Koiwa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 1, 1991, Ser. No. 769,318
Claims priority, application Japan, Oct. 4, 1990, 2-265121; Oct. 4, 1990, 2-265122; Oct. 5, 1990, 2-266357
Int. Cl.[5] F02P 3/08
U.S. Cl. 123—598 **14 Claims**



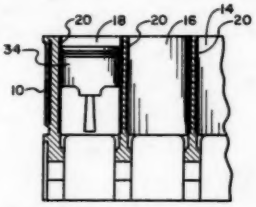
1. An ignition device for an internal combustion engine comprising:
- a DC power source;
- conversion means for raising the voltage of said DC power source to a predetermined voltage;
- charge storing means arranged to be charged with the output from said conversion means;
- an ignition coil;
- ignition signal generating means for generating an ignition signal in synchronization with the rotation of said internal combustion engine;
- switching means which is switched on in response to said ignition signal generated by said ignition signal generating means to discharge a charge stored in said charge storing means through said ignition coil; and
- control means for stopping the operation of said conversion means during a period in which said ignition signal is being transmitted from said ignition signal generating means,
- wherein said conversion means includes an oscillating circuit, and a drive circuit for amplifying an output signal transmitted from said oscillating circuit, and
- wherein said control means includes a detection circuit for detecting an output of said ignition signal from said ignition signal generating means, and a coincidence circuit responsive to an output from said oscillating circuit and an output from said detection circuit for controlling said drive circuit.

5,183,025
ENGINE BLOCK AND CYLINDER LINER ASSEMBLY AND METHOD

John L. Jorstad; Richard A. Morely, both of Richmond, and William H. Overbagh, Chesterfield, all of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Oct. 7, 1991, Ser. No. 772,727
Int. Cl.[5] F02B 75/08
U.S. Cl. 123—669 **34 Claims**

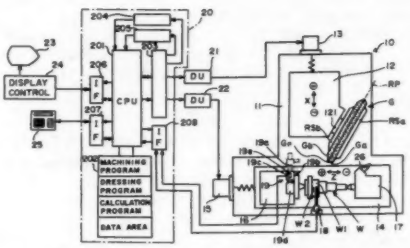
1. An engine block for an internal combustion engine, said engine block comprising:
- a) an aluminum alloy engine block body having at least one cylinder bore;
- b) a metallic liner received within the at least one cylinder bore and in intimate contact with the bore;
- c) a bonding layer of a metallic material having as a major constituent thereof on a weight basis a bonding metal having a melting temperature substantially lower than the melting temperatures of the engine block body and of the liner, wherein the bonding metal is capable of forming alloys with each of the engine block body material and the liner material, the bonding layer positioned between and metallurgically bonded to each of the liner and the cylinder bore to provide a substantially continuous metallurgical bond between the cylinder bore and the liner, wherein the bonding layer provides a substantially uninterrupted heat transfer path of metallic material between the liner and the block body.



5,183,026
METHOD AND APPARATUS FOR DRESSING AN ANGULAR GRINDING WHEEL

Norio Ohta, Okazaki; Yukio Oda, Kariya; Toshiaki Naya, Chiryu, and Tomoyuki Kasuga, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 17, 1992, Ser. No. 852,566
Claims priority, application Japan, Mar. 28, 1991, 3-64353
Int. Cl.[5] B24B 53/06, 53/08
U.S. Cl. 125—11.16 **6 Claims**



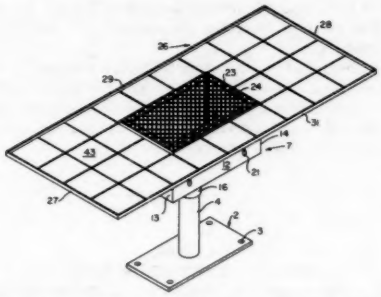
1. A method of dressing an angular grinding wheel having a first grinding surface usable for grinding a cylindrical surface of a workpiece and a second grinding surface perpendicularly intersecting said first grinding surface and usable for grinding a shoulder end surface of said workpiece, said method comprising the steps of:
- providing on said grinding wheel first and second reference surfaces parallel to said first and second grinding surfaces, respectively;
- detecting a first distance between said first grinding surface and first reference surface, and a second distance between said second grinding surface and second reference surface, before dressing operation;
- determining, based upon said detected first and second distances, a first dressing amount for dressing said first grinding surface and a second dressing amount for dressing said second grinding surface so that said first distance and said second distance would have a predetermined constant relationship after dressing operation; and
- effecting relative movement between a dressing tool and said grinding wheel to dress said first grinding surface by said first dressing amount, and to dress the second grinding surface by said second dressing amount.

5,183,027

MODULAR BARBEQUE GRILL

Marshall Saldana, 3176 Golf Dr., San Jose, Calif. 95127

Filed Nov. 27, 1991, Ser. No. 800,608
Int. Cl.[5] A47J *37/00*
U.S. Cl. 126—25 R **8 Claims**



1. A modular barbeque grill adapted to be shipped in disassembled modules for assembly by the purchaser, comprising:

a) a base unit including a flat plate and a pedestal perpendicular thereto; and

b) a firebox unit adapted to be detachably mounted on said pedestal and including an open upper end, and a grill on which food may be supported while being cooked operatively detachably mounted within said firebox adjacent said open upper end;

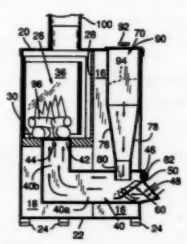
c) said firebox unit including a rectangular bottom wall, opposed end walls integral with said bottom wall and projecting perpendicularly therefrom, opposed side walls integral with said bottom and end walls an perpendicular thereto, a centrally disposed aperture formed in said bottom wall symmetrical about an axis perpendicular to said bottom wall, a mounting sleeve having inner and outer peripheries centrally mounted perpendicularly on said bottom wall, the inner periphery of said mounting sleeve corresponding to the periphery of said centrally disposed aperture, and means on said mounting sleeve manipulable to support said firebox on the end of said pedestal remote from said base plate when in assembled condition, and manipulable to lock said firebox to said pedestal when in disassembled condition for shipping.

5,183,028

BURNING APPARATUS WITH PELLET FUEL BURNER

Joseph P. Traeger, 250 S. Oak St.; Mark A. Traeuger, 530 Alder St., and Randolph J. Traeger, 540 Leo St., all of Mt. Angel, Oreg. 97362

Filed Dec. 9, 1991, Ser. No. 804,243
Int. Cl.[5] F24B *13/04*
U.S. Cl. 126—73 **9 Claims**



1. A stove comprising:

a housing,

a display chamber defined within the housing and said chamber being bounded on one side by an external window structure permitting user viewing of an interior region of the chamber from outside the housing, said chamber having a base and an opening in said base at said interior region,

a nonflammable fuel simulator disposed above said opening,

a burning zone in said housing spaced below said chamber for burning pellet fuel,

a tunnel leading from said burning zone to said opening channeling combustion gases produced in said zone into said opening and across said fuel simulator and,

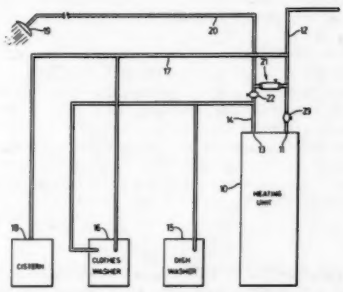
a passage connecting with the burning zone for introducing combustion supporting air to said zone.

5,183,029

HOT WATER SUPPLY SYSTEM

Gary C. Ranger, 44 Cotton Avenue, Scarborough, Ontario, Canada M1K 1Z4

Filed Apr. 14, 1992, Ser. No. 868,197
Int. Cl.[5] F24H *1/00*
U.S. Cl. 126—362 **5 Claims**



1. A hot water supply system comprising

a heating unit having a cold water intake and a delivery outlet,

a cold water supply pipe connected to said intake,

a hot water delivery pipe connected to said outlet for delivering hot water to one or more user terminals,

a first branch pipe connected to the cold water supply pipe for delivering cold water directly to the user terminals,

a second branch pipe connected to the hot water delivery pipe for delivering hot water to a further user terminal,

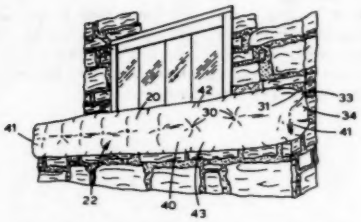
characterized by means for maintaining the temperature of water supplied to said further user terminal substantially at a selected temperature independently of water demand at the other user terminals, said means comprising

a bypass unit connected between the cold water supply pipe and said second branch pipe in shunt with the heating unit, said bypass unit including a first check valve positioned to prevent reverse flow of hot water into the cold water supply pipe, and

a second check valve connected in said second branch pipe upstream of the connection to said bypass unit, the second check valve being positioned to prevent cold water flow from the bypass unit to said hot water delivery pipe,

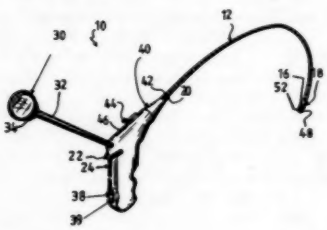
said first check valve being responsive to changes of hydrodynamic pressure differential across the valve so as to adjust the volumetric flow of cold water through the valve thereby to compensate for said changes.

5,183,030
HEARTH COMFORTER
Keile J. Woodward, 867 Joann Ct., Carmel, Ind. 46032
Filed Dec. 9, 1991, Ser. No. 803,512
Int. Cl.[5] F24B *1/18*
U.S. Cl. 126—500 **4 Claims**



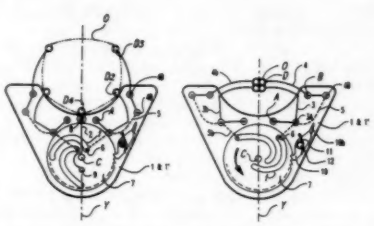
1. A hearth comforter for placement upon an upward facing surface of a fireplace hearth, said comforter comprising:
(a) a substantially rectangularly shaped body including front and rear sheets having side, top and bottom edges fastened together to form an enclosure;
(b) a batting material enclosed within said body;
(c) said body has opposite ends, each having adjacent corners that are brought proximately together and attached to one another to form end portions of an increased thickness to provide additional cushioning at the ends of the comforter which overlap the corners of the fireplace hearth;
(d) said body is primarily supported upon said hearth by at least a portion of said upward facing surface;
(e) said body has a length greater than that of said hearth such that said body overhangs at least a portion of the upward facing surface at its ends; and
(f) said body has a width sized so that a substantial amount of said upward facing surface of the hearth is covered by said comforter and also so that said body overhangs at least a portion of the front side of said hearth.

5,183,031
FIBEROPTIC INTUBATING LARYNGOSCOPE
Leonard J. Rossoff, 270-05 76th Ave.; Suite C-20, New Hyde Park, N.Y. 11042
Filed May 13, 1991, Ser. No. 699,488
Int. Cl.[5] A61B *1/06*
U.S. Cl. 128—6 **8 Claims**



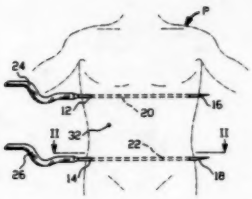
1. A fiberoptic intubating laryngoscope comprising:
a) a pistol grip having a stylet attached there to;
b) a suction channel passing through said stylet;
c) an optical head with a lens and being connected to said pistol grip for direct visualization by the user;
d) a universal adaptor having a beveled junction said universal adaptor having vents, the location of said vents being more proximally on said universal adaptor providing for less resistance and therefore greater flow of oxygen without comprising the size of said suction channel;
e) an oxygen port disposed on said pistol grip to allow for continuous flushing of oxygen via said vents in said universal adaptor, said oxygen is flushed continuously through said vents at a distal tip of said bevelled universal adaptor, said continuous flushing of oxygen keeps said lens clear of secretions encountered in endoscopy and intubation;
f) a fiberoptic bundle passing through the stylet;
g) a light source disposed within said pistol grip; and
h) a syringe port disposed on a suction inlet disposed on said pistol grip and allowing a syringe to inject a topical anesthetic via said suction channel.

5,183,032
MEDICAL RETRACTOR DEVICE
Josue J. Villalta, 6443 W. 10th Street, #202, Indianapolis, Ind. 46214, and Jean R. Passemard, 8 Rue Dela Tour aux Saints, Crecy la Chapelle, 77580, France
Division of Ser. No. 481,282, Feb. 20, 1990, Pat. No. 5,081,183.
This application Nov. 29, 1991, Ser. No. 800,440
Int. Cl.[5] A61B *17/02*
U.S. Cl. 128—20 **1 Claim**



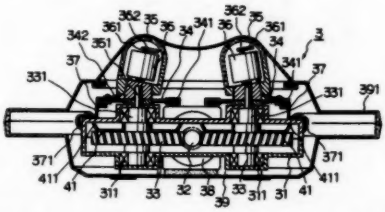
1. A retractor for wounds, incisions or cavities comprising:
a main frame;
a plurality of levers movably mounted to said main frame;
a plurality of at least three narrow blades;
driving means movably mounted to said main frame and operably associated with said levers having a closed position to move said levers locating said blades together and an open position to move said levers locating said blades apart in a polygonal formation, said levers are pivotally mounted to said main frame about parallel pivot axis and have distal ends with said blades mounted thereto, said levers further have proximal ends connected to said driving means which are operable to pivot said levers about said axis and move said blades together when in said closed position and apart when in said open position;
links having outer ends connected to said proximal ends of said levers and inner ends connected to said driving means;
said driving means includes a cam movably mounted to said main frame and connected to said links for movement of said blades; and,
locking means mounted to said main frame and operably associated with said cam operable to releasably lock said cam in an intermediate position between said closed position and said open position, said cam including a circumferential edge with a plurality of ratchet teeth formed thereof, said locking means including a ratchet pivotally mounted to said main frame and releasably biased against said ratchet teeth to limit rotational movement of said cam.

5,183,033
SURGICAL INSTRUMENT ASSEMBLY AND APPARATUS AND SURGICAL METHOD
Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023
Filed Jul. 15, 1991, Ser. No. 729,553
Int. Cl.[5] A61B *17/02*
U.S. Cl. 128—20 **17 Claims**



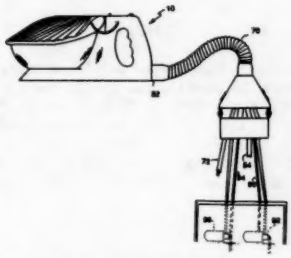
1. A method for use in laparascopic surgery, comprising the steps of:
piercing an abdominal skin surface of a patient to form a hole in said skin surface;
inserting through said hole a tensile member;
lifting the abdominal wall of said patient away from a backside of said patient by exerting tension on said tensile member; and
drawing air into the abdominal cavity of said patient during said step of lifting.

5,183,034
PORTABLE VIBRATION FINGER PRESSURE MASSAGER
Yoshikiyo Yamasaki, Sakai, and Shinichiro Fujimoto, Osaka, both of Japan, assignors to Kabushiki Kaisha Japan Health, Sakai and Kabushiki Kaisha Fuji Iryoki, Osaka, both of, Japan
Filed Dec. 23, 1991, Ser. No. 813,133
Int. Cl.[5] A61H *1/00*
U.S. Cl. 128—36 **3 Claims**



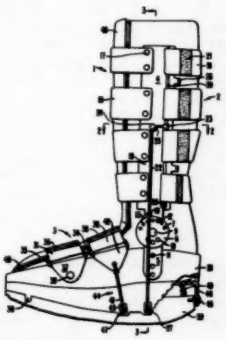
1. A portable massager comprising a drive worm disposed in a box and a pair of worm gears engaged on opposite sides of the worm and disposed rotatably in the box, rotating disks which have electrical elements provided at an outer edge surface thereof are disposed above frames located above the worm gears, massaging balls are connected with the rotating disks at angles inclined relative to axes of rotation of said rotating disks, a small motor which has wiring connected to the electrical element of the respective rotating disk is disposed in each massaging ball, a weight is rotatably and eccentrically connected at a shaft end of the motor, and outgoing panels connected with an external power source by electrical connection means are disposed on an upper face of the box in contact with the electrical elements, whereby relative swing motion and microvibration of each massaging ball can be performed optionally or simultaneously.

5,183,035
ORAL HYGIENE DEVICE
Roy A. Weir, 940 Lauder Ave., Apt. 914, Toronto, Ontario, Canada
Filed Nov. 22, 1991, Ser. No. 796,552
Int. Cl.[5] A61H *7/00*
U.S. Cl. 128—66 **17 Claims**



1. An oral hygiene device comprising:
a bowl portion having a rim therearound and
a handle portion disposed at one radial side of the bowl portion for manually supporting the device;
a lid hingedly secured to one of said portions so as to be movable between a raised position to provide access to the interior of said bowl portion and a lowered position to generally enclose said interior;
a first conduit for supplying a stream of water directed generally below the level of said rim for flushing the interior of said bowl portion;
a second conduit for supplying a stream of upwardly directed water;
first and second valve means for respectively controlling the flow of water through said first and second conduits, and
a drainage opening disposed in the bottom of said bowl portion.

5,183,036
WALKER BRACE
Richard G. Spademan, 2600 Capitol Ave. #405, Sacramento, Calif. 95816
Filed Sep. 18, 1989, Ser. No. 408,653
Int. Cl.[5] A61F *5/04*
U.S. Cl. 602—10 **24 Claims**



1. A walker brace comprising:
a foot support assembly for receiving a patient's foot including a sole;
a leg support assembly for receiving the patient's corresponding leg including at least one strap member for tightening against the leg;

an actuating system coupled with the sole and movable relative to the sole in response to the application of the patient's weight to the sole; and

a tightening mechanism operatively coupled with the actuating system and the strap member for increasing the tightness of the strap member on the leg in response to movement of the actuating system relative to the sole as a result of the application of the patient's weight to the sole.

5,183,037

RESUSCITATOR VALVE

Peter T. Dearman, Bishop'Stortford, United Kingdom, assignor to Neotronics Medical Limited, Hertfordshire, England

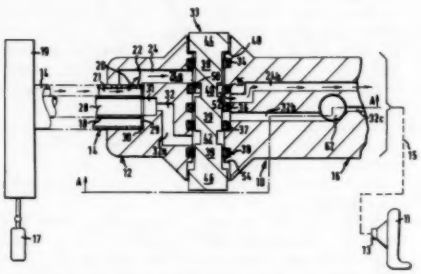
PCT No. PCT/GB89/00957, § 371 Date Feb. 12, 1991, § 102(e) Date Feb. 12, 1991, PCT Pub. No. WO90/01965, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 17, 1989, Ser. No. 655,387

Claims priority, application United Kingdom, Aug. 17, 1988, 8819514

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—204.18 **9 Claims**



9. A resuscitation system comprising a first gas line, a control module capable of supplying a pulsed stream of pressurised gas to the first line, a second gas line, means capable of supplying a continuous stream of pressurised gas to the second line, a face mask, a main valve connected to both the first and the second lines and being capable of passing gas from either one of the lines to the mask and of closing the other gas line, and a second valve for manual control of the flow of gas along the second gas line when this is connected to the mask, said resuscitation system further comprising a housing containing both the main valve and the second valve, a first gas channel within the housing having an inlet connected to the first gas line and an outlet connected to the face mask, a second gas channel also contained within the housing and having an inlet connected to the second gas line and an outlet connected to the face mask, and wherein the main valve comprises a manually controllable valve member that is moveable between a first position in which it closes the second channel and opens the first channel and a second position in which it closes the first channel and opens the second channel and wherein the second valve comprises a second manually controllable valve member that controls flow of gas through the second channel.

5,183,038

GATED PROGRAMMABLE VENTILATOR

Eric A. Hoffman, Narberth; C. William Hanson, III, Philadelphia, and Charles F. Ward, III, Ardmore, all of Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Nov. 4, 1991, Ser. No. 787,510

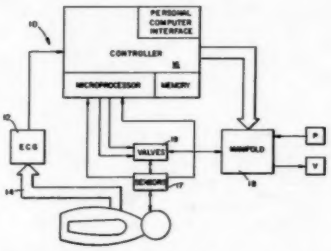
Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—204.21 **11 Claims**

1. A ventilator for ventilating the lungs of a patient with a fluid from a source of pressurized fluid, comprising:

valve means, adaptable for connection to said source and to said patient, for controlling the flow of said fluid therethrough in response to a control signal; and

a programmable controller, connected to said valve means, for generating said control signal, said programmable controller comprising a memory in which fluid flow rate



information has been stored and a microprocessor connected to said memory, said controller being operative for determining a desired flow rate of said fluid in relation to said flow rate information and for generating said control signal in relation to said flow rate.

5,183,039

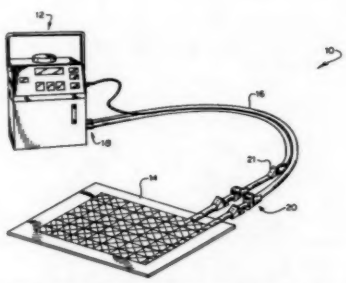
TEMPERATURE CONTROL DEVICE FOR FLUID FILLED PAD

Grigor Sarian, Los Angeles; Barry R. Crandall, Saugus, and Jeff R. Duncan, Sepulveda, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Aug. 23, 1991, Ser. No. 749,092

Int. Cl.[5] A61F *7/00;* **H05B** *1/02*

U.S. Cl. 128—400 **4 Claims**



2. A device for heating fluid to be delivered to a patient comprising:

a temperature regulator module having a tank containing fluid, a pump, and temperature control circuitry;

a fluid-filled heating pad;

tubing for transporting fluid, said tubing having first and second ends, said first ends connected to said temperature regulator module, said second ends connected to said fluid-filled heating pad, so that fluid may flow between said pad and said regulator module;

a remote thermistor adjacent the heating pad and oriented relative to the tubing for measuring the temperature of said fluid at said pad;

a tank thermistor for sensing the temperature of fluid in said tank, said tank thermistor and said remote thermistor being coupled to said temperature control circuitry so that the temperature control circuitry can use the remote thermistor to control the temperature of the heating pad.

5,183,040

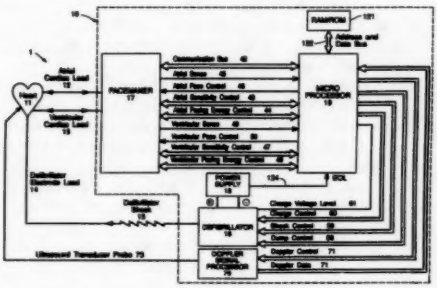
APPARATUS AND METHOD FOR DETECTING ABNORMAL CARDIAC RHYTHMS USING AN ULTRASOUND SENSOR IN AN ARRHYTHMIA CONTROL SYSTEM

Tibor A. Nappholz; Ken Koestner, both of Englewood, and Harry L. Valenta, Jr., Aurora, all of Colo., assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Mar. 8, 1991, Ser. No. 665,842

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 PG **34 Claims**



1. An antiarrhythmia pacing device for the reversion of cardiac arrhythmias comprising:

means for generating stimulation pulses and adapted to deliver said pulses to a patient's heart,

ultrasonic means adapted to be implanted within the patient's cardiovascular system for monitoring a cardiac output parameter corresponding to the volume of blood flow per unit of time within the cardiovascular system,

means for deriving a cardiac output standard based on a time history of said cardiac output parameter,

means for comparing said cardiac output parameter to said cardiac output standard,

means responsive to said comparing means for detecting and classifying a pathological cardiac arrhythmia when said cardiac output parameter is less than at least one predetermined percentage of said cardiac output standard, and

means responsive to said detecting means for controlling said generating means to operate in an antiarrhythmia pacing mode corresponding to said classification.

5,183,041

TRANSCUTANEOUS ELECTRIC NERVE STIMULATOR

Mamoru Toriu, Sayama, and Mitsuru Kitamura, Yokohama, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto and ITO Co., Ltd., Tokyo, both of, Japan

Filed Aug. 4, 1989, Ser. No. 389,583

Claims priority, application Japan, Aug. 11, 1988, 63-106499[U]

Int. Cl.[5] A61N *1/08*

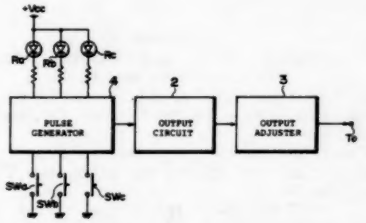
U.S. Cl. 128—421 **3 Claims**

1. A transcutaneous electric nerve stimulator comprising:

means for selecting a treatment mode;

a plurality of indicators respectively disposed in association with treatment modes which can be set in the stimulator;

pulse generator means for producing a low-frequency pulse having a frequency associated with a selected treatment mode; and



output pulse monitor control means for causing said indicator corresponding to the selected treatment mode to blink in sychronism with the produced low-frequency pulse.

5,183,042

ELECTROMAGNETIC METHOD AND APPARATUS TO MEASURE CONSTITUENTS OF HUMAN OR ANIMAL TISSUE

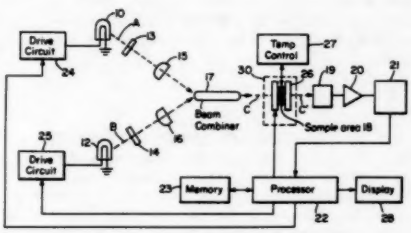
Hannu Harjunmaa, Holden; Yitzhak Mendelson, and Yi Wang, both of Worcester, all of Mass., assignors to Vivascan Corporation, Southboro, Mass.

Continuation-in-part of Ser. No. 527,514, May 23, 1990, Pat. No. 5,099,123, which is a continuation-in-part of Ser. No. 511,229, Apr. 19, 1990, Pat. No. 5,137,023, which is a continuation-in-part of Ser. No. 511,341, Apr. 19, 1990, Pat. No. 5,112,124. This application Jul. 3, 1991, Ser. No. 725,502

Claims priority, application European Pat. Off., May 23, 1989, 89810382.5

Int. Cl.[5] A61B *5/00*; G01N *21/59*

U.S. Cl. 128—633 **28 Claims**



21. A non-invasive apparatus for measuring the concentration of analytes in a living tissue, comprising:

a) a source of electromagnetic radiation for illuminating the tissue with an electromagnetic beam comprised of alternate periods of different wavelengths, one of the alternate periods having a first wavelength that is absorbed by the analyte, and the other alternate period having a wavelength selected so as to have an extinction coefficient in the tissue identical with that of said first wavelength;

b) a detector means for detecting the electromagnetic beam after reaction with the tissue to produce a first electrical signal proportional to the intensity of said electromagnetic beam; and

c) analyte level changing means for changing the level of analyte in the tissue;

d) intensity control means for adjusting the intensity relation between wavelength periods of the illuminating beam so as to produce, a reference level component in the first electrical signal when a minimum level of analyte is present in the tissue whereby the first electrical signal when analyte is present is proportional to the concentration of analyte in the tissue;

e) temperature control means for maintaining the temperature of the tissue substantially constant during measurement.

5,183,043

LOW RESISTANCE ELECTRICAL PICK-UP AND MANUFACTURE THEREOF

David M. Band, Surrey, and David G. Penman, London, both of England, assignors to Surgicraft Limited, Redditch, United Kingdom

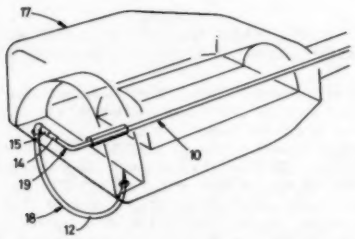
PCT No. PCT/GB89/00631, § 371 Date Jan. 28, 1991, § 102(e) Date Jan. 28, 1991, PCT Pub. No. WO89/11819, PCT Pub. Date Dec. 14, 1989

PCT Filed Jun. 7, 1989, Ser. No. 613,904

Claims priority, application United Kingdom, Jun. 8, 1988, 8813570

Int. Cl.[5] A61B *5/402*

U.S. Cl. 128—642 **14 Claims**



9. A method of manufacture of a fetal scalp electrode or other biosensing electrode of the type having an arcuate needle of stainless steel, characterised in that the arcuate needle is plated with nickel and then silver and an area of the silver layer, at least on the outside of the curve of the needle, is then chloridized and coated with bio-compatible plastics, and the remainder of the silver layer is coated with a non-conducting varnish.

5,183,044

NONCONTACT TYPE TONOMETER

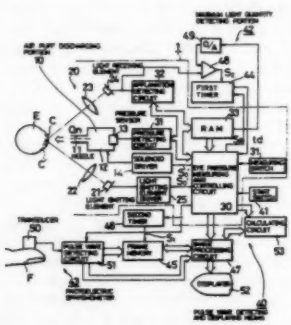
Kouji Nishio, and Yoshihiko Hanamura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Continuation of Ser. No. 325,944, Jun. 29, 1988, Pat. No. 5,092,334. This application Oct. 10, 1991, Ser. No. 774,313

Claims priority, application Japan, Jun. 30, 1987, 62-163678; Jun. 30, 1987, 62-163679

Int. Cl.[5] A61B *3/16*

U.S. Cl. 128—648 **6 Claims**



1. A noncontact type tonometer comprising:

fluid projecting means for projecting a fluid toward an eye-to-be-tested;

eye pressure measuring means for obtaining a measured value of pressure of the eye-to-be-tested from a relation between a pressure of the fluid and a transfiguring quantity of the eye-to-be-tested due to the projection of the fluid;

pulse wave detecting means for detecting a pulse wave from of a person-to-be-tested at a position remote from the eye-to-be-tested due to the projection of the fluid; and

calculating means, communicating with the pulse wave detecting means and the eye pressure measuring means, for determining at least one of the maximum eye pressure value, minimum eye pressure value and average eye pressure value of the eye-to-be-tested through calculation with reference to;

a maximum fluctuation width of the pulse wave form detected by the pulse wave detecting means;

a pulse wave fluctuating quantity at the time point when the eye pressure was measured by the eye pressure measuring means;

a difference between a phase of the pulse wave form at the eye-to-be-tested and at the position remote from the eye-to-be-tested; and

the measured value of the eye pressure.

5,183,045

NMR MEASURING METHOD AND MEASURING APPARATUS FOR TISSUE OF A LIVING BODY

Susumu Takamura, Kusatsu; Takashi Nakamura; Makoto Okawauchi, both of Shiga; Harumi Toda, Kyoto; Ichiro Kanki, Hirakata; Minoru Yoshida, Shiga; Toshiyuki Imoto, Kyoto; Naomi Negayama, Amagasaki, and Koichi Oka, Kusatsu, all of Japan, assignors to Otsuka Electronic Co., Ltd., Osaka, Japan

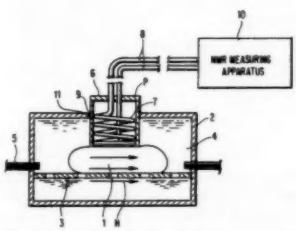
PCT No. PCT/JP89/00589, § 371 Date Apr. 16, 1990, § 102(e) Date Apr. 16, 1990, PCT Pub. No. WO89/12422, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 12, 1989, Ser. No. 460,336

Claims priority, application Japan, Jun. 17, 1988, 63-150899

Int. Cl.[5] A61B *5/055*

U.S. Cl. 128—653.2 **12 Claims**



1. An NMR measuring method for tissue of a living body immersed in a perfusion solution comprising

(1) immersing the tissue of the living body in the perfusion solution,

(2) placing a receiver coil for receiving an NMR free induction signal in contact with or in close vicinity to only one side of the tissue,

(3) holding the receiver coil to prevent contact with the perfusion solution, and

(4) obtaining an NMR measurement.

5,183,046

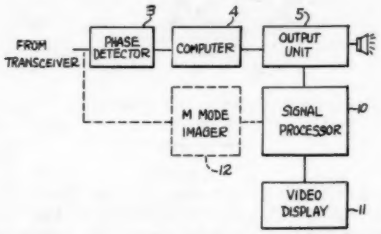
ULTRASONIC PLETHYSMOGRAPH

Kirk W. Beach; David J. Phillips, both of Seattle, Wash., and John Kansky, Indianapolis, Ind., assignors to Board of Regents of the University of Washington, Seattle, Wash.

Continuation of Ser. No. 644,477, Jan. 18, 1991, Pat. No. 5,088,498, which is a continuation of Ser. No. 258,534, Oct. 17, 1988, abandoned. This application Nov. 15, 1991, Ser. No. 792,584

Int. Cl.[5] A61B *8/08*

U.S. Cl. 128—661.07 **14 Claims**



1. The method of quantifying relative displacement of internal body matter at different depths below the skin which method comprises transmitting a first burst of ultrasound into the body from the skin, measuring the phase of ultrasound of the first burst reflected from internal body matter a first predetermined period after transmission of the first burst, measuring the phase of ultrasound reflected by internal body matter a second predetermined period after transmission of said first burst, subsequently transmitting a second burst of ultrasound into the body, measuring the phase of ultrasound of the second burst reflected from internal body matter a predetermined period of the same duration as the first predetermined period after transmission of the second burst, measuring the phase of the ultrasound of the second burst reflected from an internal body matter a predetermined period of the same duration as the second predetermined period after transmission of the second burst, and comparing the change in measured phases of the reflected ultrasound to determine the relative displacements of body matter at the different depths corresponding to the length of time required for ultrasound to travel to and return from body matter during the first and second predetermined periods.

5,183,047

DOPPLER FLOW VELOCITY METER

Christoph B. Burckhardt, Muttenz, Switzerland, assignor to Kontron Instruments Holdings NV, Curacao, Netherlands Antilles

Filed May 9, 1991, Ser. No. 697,892

Claims priority, application Switzerland, May 21, 1990, 1720/90

Int. Cl.[5] A61B *8/06*

U.S. Cl. 128—661.09 **9 Claims**

1. A Doppler flow velocity meter for measuring the flow velocity of a fluid carrying particles which reflect ultrasonic waves, comprising:

(a) an ultrasonic transducer for irradiating the fluid with ultrasonic wave pulses according to corresponding transmit pulses at a predetermined pulse repetition frequency, to receive echo waves reflected by the particles in the fluid and to emit corresponding echo signals;

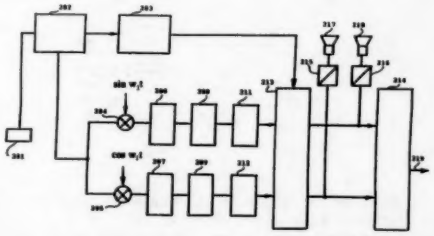
(b) a transmitter connected to said ultrasonic transducer for generating transmit pulses having a spectrum of two adjacent but separate frequency bands with which the ultrasonic transducer is excited to transmit the ultrasonic wave pulses;

(c) a receiver connected to said ultrasonic transducer for receiving and processing echo signals which correspond to at least two different echo waves reflected by the particles at a set point of the flow path in response to first and second transmitted pulses, in which the adjacent but separate frequency bands are each processed in a separated signal processing channel;

(d) an evaluator connected to the output of the receiver, with which the output signal corresponding to the flow velocity is derived from the Doppler information obtained with the receiver;

(e) the receiver further includes:

(e.1) means in each of the signal processing channels for carrying out a quadrature demodulation of the echo signals received from the ultrasonic transducer in each of the frequency bands and for outputting quadrature signals,



each defining a complex measured value (P(0), P(Δt), P(2Δt), . . .);

(e.2) Means for processing the quadrature signals from the two signal channels and means for producing a first output signal which corresponds to an average value of flow velocity at said set point of the flow path;

(e.3) Means for correlating said first output signal with said quadrature signals at the output of one of the signal processing channels for producing complex correlated values (P(Δt/2), P(3Δt/2), . . .); and

(e.4) Means for evaluating a signal sequence corresponding to said complex measured values and said correlated values (P(0), P(Δt/2), P(Δt), P(3Δt/2), P(2Δt), . . .) and obtaining the instantaneous value of the flow velocity.

5,183,048

METHOD AND APPARATUS FOR REMOVING ARTIFACTS FROM AN ULTRASONICALLY GENERATED IMAGE OF A SMALL CAVITY

Michael J. Eberle, Lobata, Calif., assignor to Endosonics Corporation, Rancho Cordova, Calif.

Filed Jun. 24, 1991, Ser. No. 719,804

Int. Cl.[5] A61B *8/12*

U.S. Cl. 128—662.06 **12 Claims**

1. A method of imaging a cross section of a small cavity such as a coronary vessel using an imaging apparatus having a transducer, wherein the transducer flexes in response to a received electrical pulse so as to emit an ultrasonic wave into an ambient environment of the array within the small cavity, the method comprising the steps of:

a. inserting the transducer into a first area of the cavity;

b. delivering an electrical pulse to the transducer in order to generate an ultrasonic wave in the ambient environment of the array;

c. detecting a ringdown signal generated by a damped oscillation of the transducer in response to its excitation by the electrical pulse;

d. storing the ringdown signal as a reference waveform;

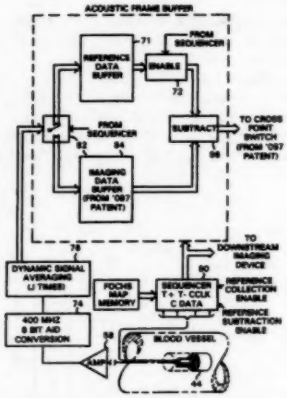
e. inserting the transducer into a second area of the cavity having a diameter smaller than that of the first section;

f. emitting ultrasonic waves into the second area by mechanically exciting the transducer in response to electrical pulses;

g. generating an echo waveform in response to echoes of the

emitted waves that are reflected off inner walls of the second section and impinge upon the transducer;

h. subtracting the reference waveform from the echo waveform for the purpose of creating an imaging waveform stripped of the ringdown signal; and



i. generating a visual image using a plurality of the imaging waveforms.

5,183,049

METHOD FOR FORMING AND ULTRASONIC IMAGE

Toshihiko Abe, Tagajou, Japan, assignor to Japan as represented by Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 15, 1991, Ser. No. 775,558
Int. Cl.[5] A61B *8/00*
U.S. Cl. 128—663.01 **4 Claims**

1. A method for the ultrasonic image-formation of a body under inspection by scanning the body with an ultrasonic beam emitted from an ultrasonic probe having an ultrasonic objective lens facing the body which comprises:

attaching a central ultrasonic absorber in the form of a disc to the center of the surface of the ultrasonic objective lens of the ultrasonic probe facing the body under inspection; and

inserting an auxiliary concave lens between the ultrasonic objective lens of the ultrasonic probe and the body under inspection.

5,183,050

PULSE WAVE SENSOR

Norio Kawamura, Nagoya, Japan, assignor to Colin Electronics Co., Ltd., Aichi, Japan

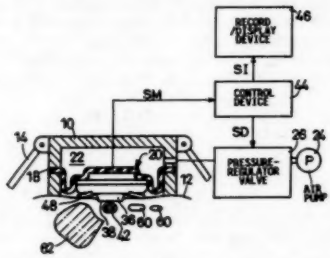
Filed Nov. 12, 1991, Ser. No. 790,354
Claims priority, application Japan, Apr. 16, 1991, 3-34295[U]
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—687 **8 Claims**

1. A pulse wave sensor for detecting a pressure pulse wave produced from an arterial vessel of a living subject in synchronism with heartbeat of the subject, the sensor having a press surface adapted to be pressed on a body surface of the subject over the arterial vessel, the sensor comprising:

means for providing a protruding portion protruding from said press surface, said protruding portion having a top surface adapted to be pressed on said body surface of said subject;

sensing means provided in said top surface of said protruding portion, for detecting said pressure pulse wave from said arterial vessel via said body surface; and

a sheet spring provided around said protruding portion and having a height generally equal to, or greater than, a height of said protruding portion as measured from said press surface, said sheet spring being deflectable in a direction in which said top surface of said protruding portion is pressed on said body surface.

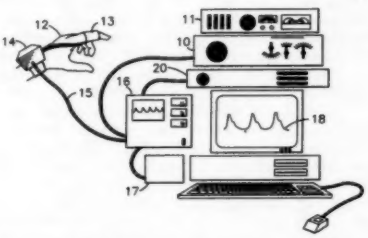


5,183,051

MEANS AND APPARATUS FOR CONTINUOUSLY DETERMINING CARDIAC OUTPUT IN A SUBJECT

Jonathan Kraidin, 3301 Indian Queen La., Philadelphia, Pa. 19129, and Irwin Gratz, 411 Woodbine Ave., Penn Valley, Pa. 19072

Filed Jan. 14, 1991, Ser. No. 640,968
Int. Cl.[5] A61B *5/02*
U.S. Cl. 128—687 **21 Claims**



14. Apparatus for continuously determining cardiac output (CO) in a subject comprising:

non-invasive sensor means for continuously measuring arterial blood pressure data at a site on said subject;

means for continuously converting said arterial blood pressure data to a digital signal representative of a pulse contour curve waveform;

means for continuously calculating heart rate (HR), grade of slope, systolic peak pressure, the presence of reflected waves, and pressure at the dicrotic notch from said digital signal;

means for determining the area, A, under said pulse contour curve from the start of a pulse to the dicrotic notch of said pulse contour curve;

means for subtracting from said area A any portion, B, of said area A, representing an approximate area due to wave reflection to obtain a stroke area, SA; and

means for calculating CO as a product of SA and HR.

5,183,052

AUTOMATIC BIOPSY INSTRUMENT WITH CUTTING CANNULA

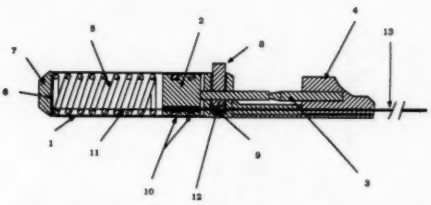
Richard A. Terwilliger, 1489 Cas Vallecita, Alamo, Calif. 94507

Filed Nov. 7, 1990, Ser. No. 610,006
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—753 **18 Claims**

1. An automatic biopsy instrument including:

a body;

a cavity defined in said body;
a piston mounted in said cavity;
means for biasing said piston relative to said cavity;
means for urging said piston against the biasing means;
an elongate cannula with an elongate inner bore;
means for securing said cannula to said piston;



means for communicating said inner bore of said cannula with the cavity of said body;
a stylet positioned in said inner bore of said cannula; and
said cannula being extended out beyond a tip of said stylet in response to said biasing means in order to create a tissue collection space.

5,183,053

ELLIPTICAL BIOPSY PUNCH

Charles R. Yeh, Plantation, Fla., and Donald H. Huldin, Okemos, Mich., assignors to Acuderm, Inc., Ft. Lauderdale, Fla.

Filed Apr. 12, 1991, Ser. No. 685,466
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 **7 Claims**

1. A disposable surgical instrument in the form of a biopsy punch for making an elliptical incision in the skin to remove skin abnormalities, comprising:

(a) an elongated handle member formed of a hard plastic material including a means for retaining a cutting member formed integrally on one end of said handle member; and

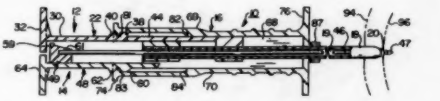
(b) a cutting member retained by said retaining means and projecting therefrom to expose a cutting surface for making the incision, said cutting member having a first and second portion, said first portion being disposed within said retaining means and being substantially annular in cross-section and said second portion being generally elliptical in cross-section.

5,183,054

ACTUATED BIOPSY CUTTING NEEDLE WITH REMOVABLE STYLET

Richard A. Burkholder, St. Peters, Mo., and Gregory G. Acker, Springboro, Pa., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Sep. 9, 1991, Ser. No. 756,650
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 **17 Claims**



1. A biopsy device for sampling tissue comprising:

a) an elongated cannula having a sharpened distal end;

b) an elongated stylet having a sharpened distal end and a recess located at the distal end of said stylet, said recess located proximal to the ultimate distal end of said stylet, said recess extending transverse to the elongated axis of said stylet and extending into the body of said stylet, said stylet insertable into said cannula along a common linear axis of said stylet and said cannula, said stylet having an outer diameter slightly less than the inner diameter of said cannula, said stylet being removable from within said cannula, said stylet removable from said cannula essentially along said common linear axis whereby said stylet is also removable from said biopsy device;

c) a cannula actuator for moving said cannula along the linear axis of said cannula;

d) means for connecting said cannula to said cannula actuator;

e) a stylet actuator for moving said stylet along the linear axis of said cannula for advancing said stylet into the tissue to be sampled;

f) means for connecting said stylet to said stylet actuator;

g) a housing having a relatively open first end for receiving both said cannula actuator and said stylet actuator therethrough and a closed second end through which said cannula slidably extends, said cannula actuator and said stylet actuator constrained within said housing to relative parallel motion along an axis parallel to the elongated axis of said cannula; and,

h) means for selectively allowing removal of said stylet and said stylet actuator for said biopsy device,

whereby a sample collected in said recess can be removed from said biopsy device by removing said stylet from said biopsy device while leaving said cannula in position in the tissue from which the biopsy sample is collected.

5,183,055

DEVICE FOR OBTAINING TESTICULAR OR PENILE SIZE AND VOLUME MEASUREMENTS

Stephen W. J. Seager, 10301 Norton Rd., Potomac, Md. 20854

Filed Dec. 27, 1991, Ser. No. 813,655
Int. Cl.[5] A61B *5/103*
U.S. Cl. 128—774 **2 Claims**

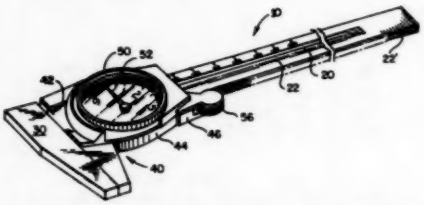
1. A hand manipulable device which is useful in determining urological and andrological clinical measurement of one or more organs of the anatomy and for calculation of related volumetric capacity thereof, comprising:

a) a graduated rule having fixed gradations embossed in an upper surface thereof, the rule terminating at one end in an anatomy contacting fixed jaw, said rule having an elongated cavity therein with a first rack defined on at least one side of the cavity; a second rack being defined on an outside edge of the rule, both said racks being coplanar and parallel to each other;

b) a movable jaw assembly in opposed measurement relation

to the fixed jaw, the movable jaw bearing markers for the fixed gradations of the rule, on an anatomy contacting end thereof;

c) a refined marker meter superposed on the movable jaw assembly, in driven engagement with the first rack of the rule, said meter including a first pinion, engaging said first rack for activating a marker of the refined meter, relative to the fixed gradations of the rule;



d) a second pinion on the movable jaw assembly in constant engageable contact with the second rack, the second pinion being rotateable by a user to apply incremental movements to the movable jaw assembly and the refined marker meter, relative to the gradations of the rule; both said pinions being coplanar, relative to each other.

e) a comparator chart on the measurement device whereby capacitive testicular volume may be computed by width-length measurements obtained from the device.

5,183,056

INDUCTIVE MOTION SENSOR

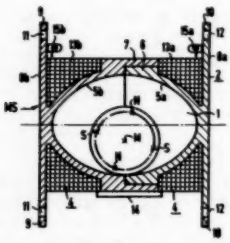
Bjoern Dalen, Stockholm; Kenth-Ake-Sune Nilsson, Akersberga; Kurt Hoegnelid, and Liliane Wecke, both of Sundbyberg, all of Sweden, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 18, 1990, Ser. No. 599,412

Claims priority, application European Pat. Off., Oct. 20, 1989, 89119524

Int. Cl.[5] A61B *5/103*

U.S. Cl. 128—782 **13 Claims**



1. Inductive motion sensor connected to a subject, the inductive motion sensor having a coil and a magnet member movable relative to said coil, comprising: said magnet member being in a region free of magnetic materials having at least four magnetic poles, the number, of south poles being identical to the number of north poles; and the pole strength of the magnetic poles being dimensioned and the magnetic poles being located on the magnet member such that the magnet member is situated in a neutral equilibrium position with respect to external forces exerted on the magnetic poles by a uniform magnetic field, whereby said motion sensor senses movement of the subject by means of a dislocation of said magnetic member relative to said coil.

5,183,057

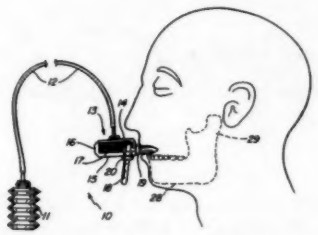
FLUID MOTION DEVICE (FMD) FOR EXERCISING THE TEMPOROMANDIBULAR JOINT

Steven B. Syrop, 36 Aldridge Rd., Chappaqua, N.Y. 10514, and Howard Israel, 47 Park Cir., Great Neck, L.I., N.Y. 11024

Filed Jul. 30, 1991, Ser. No. 738,105

Int. Cl.[5] A61G *15/00*; A61C *5/14, 19/04*

U.S. Cl. 128—845 **42 Claims**



18. A fluid motion device for exercising the temporomandibular joint which connects the upper and lower jaws, comprising:

a fluid source;

first and second members;

hinge means for holding said first and second members together while permitting at least said first member to move relative to said second member;

an expandable and contractible fluid reservoir positioned between said first and second members;

a fluid channel connecting said fluid source and said expandable and contractible fluid reservoir, said fluid channel providing fluid communication between said fluid source and said fluid reservoir;

said first and second members with said expandable and contractible fluid reservoir therebetween being insertable between said jaws for moving at least one of said jaws when said fluid reservoir expands and contracts; and

means for forcing fluid from said fluid source into said fluid reservoir to expand said fluid reservoir, thereby moving apart said first and second members and moving said at least one of said jaws to exercise said temporomandibular joint.

5,183,058

CEPHALIC EXPANSION APPARATUS AND THE METHOD OF USING TO TREAT HEAD INJURY

Woodrow W. Janese, Janus Medical Instruments, 2806 N. Navaro, Suite M, Room B, Victoria, Tex. 77901

Continuation-in-part of Ser. No. 560,014, Jul. 27, 1990, abandoned, which is a continuation of Ser. No. 205,250, Jun. 10, 1988, abandoned. This application Aug. 19, 1991, Ser. No. 747,723

Int. Cl.[5] A61F *13/00*

U.S. Cl. 128—847 **18 Claims**

1. An apparatus for the treatment of a swollen brain comprising:

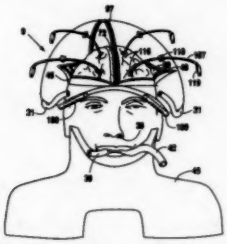
a flexible container for holding a volume of sterile fluid and an expanding brain of a craniotomized patient, the walls of said container forming an external, inferior surface for application to the scalp of the patient and an upper side having a flap formed therein for opening to expose the internal, inferior surface of said container when applied to the scalp;

a plurality of access ports formed in the walls of said container for circulating the sterile fluid into and out of said container;

means on the external, inferior surface of said container for water tight attachment of said container to the scalp of the patient;

a circumferential expansion flap for increasing the volume of said container when filled with the sterile fluid;

means on the flap formed in the upper side of said container for sealing said container to prevent the loss of the sterile fluid from said container; and



a semicircular support rod for attachment to a stationary support for encircling a portion of the head of the patient and engaging the external, inferior surface of said container to support said container when filled with the sterile fluid.

5,183,059

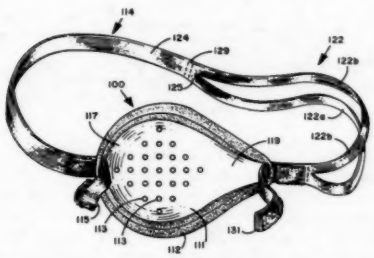
EYE SHIELD RETENTION SYSTEM

David Leonardi, 2927 S. Industrial Rd., Las Vegas, Nev. 89109

Continuation-in-part of Ser. No. 467,684, Jan. 19, 1990, abandoned. This application Jan. 16, 1992, Ser. No. 821,799

Int. Cl.[5] A61F *9/00*

U.S. Cl. 128—858 **25 Claims**



1. A strap retention system for holding an eye shield on a user's head across the bony orbital rim of the user's eye, the eye shield positioned to have an upper end extending above the eye to be protected and a lower end extending below the eye to be protected, comprising:

a) a first strap having a first end and a second end,

b) a second strap having a first end and a second end,

c) means for attaching the first end of the first strap to a lower portion of the eye shield,

d) means for attaching the first end of the second strap to an upper portion of the eye shield,

e) means for connecting the second end of the first strap to the second end of the second strap at a location at the approximate rear of the user's head, and

f) the second strap being bifurcated intermediate its first end and second end into an upper strap segment and a lower strap segment so that the second strap member can encircle the user's head from the upper portion of the eye shield to the connection location at the approximate rear of the user's head,

whereby the separation of the upper strap segment from the lower strap segment on the second strap member prevents the upper strap segment and the lower strap segment from slipping from the user's head such that the strap retention system would become loosened enough to allow the eye shield to become dislodged from the user's eye.

5,183,060

DEVICE FOR PROTECTING PORTION BETWEEN TOES

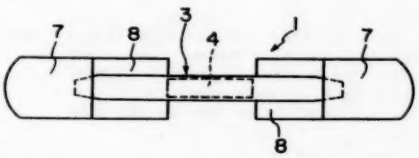
Souichi Shito, 1-38-7, Kamakura, Katsushika-ku, Tokyo, Japan

Filed Feb. 25, 1991, Ser. No. 659,651

Claims priority, application Japan, May 11, 1990, 2-49429[U]; Jul. 23, 1990, 2-77944[U]; Oct. 12, 1990, 2-107084[U]

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—882 **7 Claims**



1. A toe-base protecting device comprising:

a toe-base protecting member comprising a cylindrical bag that is formed of a hygroscopic and flexible material, said bag being filled with hygroscopic particles and rolled in another hygroscopic and flexible material into a substantially rod-like shape; and

an adhesive tape that is provided on each end of said protecting member, said adhesive tape for sticking on a surface of a boot with said protecting member being put between toes.

5,183,061

SILICON COMPOUNDS IN BONE TREATMENT

Karl E. Wiegand, and Patrick C. Hu, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 222,899, Jul. 22, 1988, abandoned. This application Apr. 26, 1991, Ser. No. 692,778

The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.

Int. Cl.[5] A61B *19/00*

U.S. Cl. 128—897 **21 Claims**

1. A process for stimulating the growth of calcium-containing bone tissue in a warm-blooded vertebrate, said process comprising adminsitering to said vertebrate an effective amount of a physiologically acceptable organic silicon compound wherein silicon therein is solely bonded to one of a group consisting of oxygen, fluorine, chlorine and bromine, such that not less than one-fourth of the valences of silicon are satisfied by bonding to oxygen.

5,183,062

CIGARETTE

Jack F. Clearman, Blakely, Ga., and Billy T. Conner, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation of Ser. No. 642,233, Jan. 12, 1991, which is a continuation-in-part of Ser. No. 488,516, Feb. 27, 1990, Pat. No. 5,027,837. This application Apr. 21, 1992, Ser. No. 873,529

Int. Cl.[5] A24F *1/22*

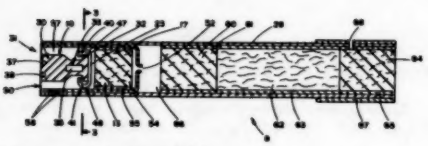
U.S. Cl. 131—194 **80 Claims**

1. A cigarette comprising:

(a) a combustible fuel element having a portion which burns during use and a portion which does not burn during use;

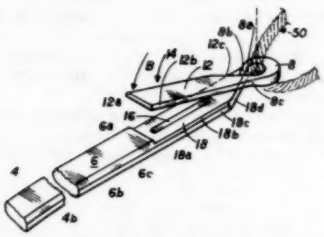
(b) aerosol generating means (i) physically separate from, longitudinally adjacent, and in a heat exchange relation-

ship with, the fuel element, and (ii) including a paper substrate;



(c) a mouthend piece; and
(d) tobacco.

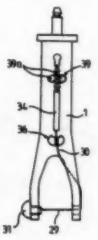
5,183,063
DENTAL FLOSS AND PRE-THREADED LEADER
Larry L. Ringle, 645-2 Woodside Sierra, Sacramento, Calif. 95825, and Ronald G. Lax, Grass Valley, Calif., assignors to Larry Lee Ringle, Sacramento, Calif.
Filed Jun. 10, 1991, Ser. No. 712,405
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—321 **23 Claims**



1. An integrally formed dental floss and leader for use with bridges, implants or other structures such as teeth and prosthodontic devices, comprising in combination:
said leader having a free end for threading into interproximal dental spaces and a tethered end which supports said floss,
said tethered end including means for fixedly prefusing said floss to said leader thereto in a manner preventing substantial sliding of said floss relative to said tethered end of said leader.

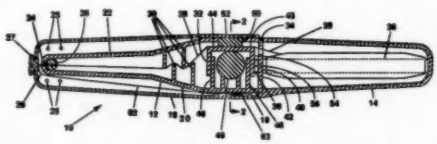
5,183,064
DENTAL CLEANSING DEVICE AND INTERDENTAL FLOSS FOR SUCH A DEVICE
Frederic Barth, 11, Place du Marché, Chevry II, F-91190 Gif-sur-Yvette, France
Division of Ser. No. 452,354, Dec. 19, 1989, Pat. No. 5,094,256. This application Dec. 31, 1991, Ser. No. 815,035
Claims priority, application France, Dec. 19, 1988, 88 16729; Apr. 27, 1989, 89 05618; Jun. 27, 1989, 89 08509
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—323 **17 Claims**

1. An interdental cleansing device, comprising:
a fork-shaped instrument having a body and two separated arm extending from an end of said body, each said arm having a free end and a needle eye of predetermined cross section near its free end, the two arm being separated by a predetermined distance at a point of said needle eyes;
a dental floss adapted for being fitted onto said instrument so as to pass through and extended between the needle eyes of the two arms, wherein said dental floss comprises a floss portion having two opposite ends, a length of said floss portion between said two opposite ends greater than said predetermined distance, the floss portion being provided at one of its ends with a guide rod having a cross section smaller than the needle eyes and being provided at another of its ends with a stop button having a cross-section greater than the needle eyes, and said fork-shaped instrument further comprises a guide stop attached to said body and adapted for stopping the guide rod, whereby the location of the guide stop on the instrument body with



respect to the needle eyes and the length of the floss portion are related to one another such that with the floss portion being fitted onto the instrument, with the stop button stopped at one needle eye and the guide rod locked behind the guide stop, the floss portion is pulled taut.

5,183,065
DENTAL FLOSSING TOOL
Robert F. Mason, 10763 Hedda Pl., Cerritos, Calif. 90701
Continuation-in-part of Ser. No. 353,592, May 18, 1989, abandoned, and Ser. No. 478,527, Feb. 12, 1990, abandoned. This application Mar. 27, 1991, Ser. No. 675,869
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—323 **14 Claims**



1. A dental flossing tool comprising:
an elongated hollow handle portion having a single hollow tip projecting from one end of said handle portion,
a supply of dental floss mounted in said handle portion,
means for feeding said dental floss through said tool without exposure of said floss to air outside of said tool and for preventing exposure of said floss prior to said floss exiting said tip,
resilient means substantially enclosed within said tip so that said tip extends beyond said resilient means and serving to prevent moisture from entering said tool while allowing said floss to exit from said too, and
locking means located within said tool for selectably permitting removal of said floss from said supply in infinitely variable locked lengths.

5,183,066
SPRAY NOZZLE CLEANING APPARATUS AND METHOD
Gary L. Hethcoat, Ontario, assignor to General Dynamics Corp., Air Defense Systems Division, Pomona, Calif.
Filed Apr. 2, 1991, Ser. No. 679,493
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—54 **15 Claims**

4. A cleaning apparatus for cleaning spray gun nozzles, comprising:
a first, cleaning chamber having an entrance for receiving the nozzle of a spray gun into a cleaning position in said chamber;

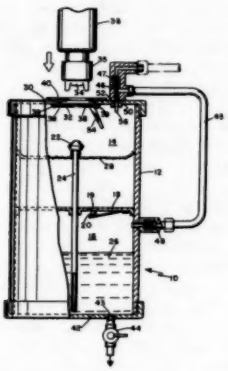
at least one cleaning spray head in said cleaning chamber directed at the cleaning position;

a second, reservoir chamber for holding a supply of cleaning fluid;

a first connecting passageway between the reservoir chamber and the cleaning head for delivery of cleaning fluid to the cleaning head;

a gas supply line connected to the reservoir chamber for supplying gas under pressure to the reservoir chamber to force cleaning fluid from the reservoir chamber to the cleaning head;

a valve in the supply line moveable between closed and open positions for controlling the connection of the gas supply to the reservoir chamber;



an actuating arm associated with the valve and moveable between inoperative and operative positions to move the valve between the closed and open positions;

the actuating arm being positioned in the cleaning chamber adjacent the entrance and being moveable between the inoperative and operative positions in response to movement of a spray nozzle into the cleaning chamber; and

a second connecting passageway between said first and second chambers for returning spent cleaning fluid to the reservoir chamber at the end of a cleaning cycle, and valve means in said second connecting passageway for closing said passageway during a cleaning cycle.

5,183,067

CLEANING AND DRYING OF ELECTRONIC ASSEMBLIES

David S. L. Slinn, Bristol, Great Britain, assignor to ISC Chemicals Limited, London, United Kingdom

Division of Ser. No. 376,651, Jul. 7, 1989, Pat. No. 5,055,138. This application Sep. 5, 1991, Ser. No. 755,137

Claims priority, application United Kingdom, Jul. 8, 1988, 8816343; Feb. 2, 1989, 8902280

Int. Cl.[5] B08B *3/10*

U.S. Cl. 134—61 **14 Claims**

1. Apparatus for cleaning and drying components comprising:

a reservoir for a highly fluorinated compound;

heating means for heating and evaporating said highly fluorinated compound;

a cleaning chamber;

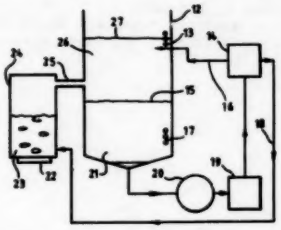
an organic liquid solvent in said cleaning chamber;

a space above said organic solvent in said cleaning chamber;

means for conducting highly fluorinated compound vapor produced by said heating and evaporating means to said cleaning chamber for covering and directly heating said organic solvent in said cleaning chamber;

said components to be cleaned being immersed into and removed from said organic solvent in said cleaning chamber;

means for condensing said highly fluorinated compound vapor in said cleaning chamber; and



means for recycling said highly fluorinated compound and organic solvent to said reservoir and cleaning chamber, respectively.

5,183,068

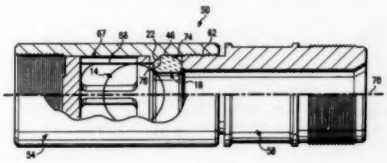
BALL AND SEAT VALVE

Albert C. Prosser, Norman, Okla., assignor to Coors Technical Ceramics Company, Norman, Okla.

Filed Jun. 4, 1991, Ser. No. 710,137

Int. Cl.[5] F16K *15/04*

U.S. Cl. 137—1 **17 Claims**



16. A method for extending the useful life of a ball and ceramic seat valve by exerting a compressive force toward the inner bore of said seat, wherein the compressive force component in the direction of said inner bore is created by a beveled surface on said seat that forms an angle with the central axis of said seat of between about 40° and 50°, and is adjustable by altering the axial force exerted on said seat to change the compressive force exerted by said beveled surface.

5,183,069

ADJUSTABLE VALVE STEM APPARATUS FOR VALVE GATED INJECTION MOLDING DEVICES

Ralph O. Berg; Fred J. Lang, Jr., both of Rochester, and Dennis B. Kupka, Albion, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 702,665, May 17, 1991, Pat. No. 5,080,575. This application Jan. 13, 1992, Ser. No. 820,103

Int. Cl.[5] F16K *31/50*

U.S. Cl. 137—15 **4 Claims**

1. A method of adjusting a valve stem which communicates with a workpiece in an machine assemblage, comprising the steps of:

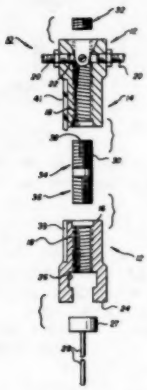
a) releasing an adjustable valve apparatus from the machine assemblage, said apparatus comprising:

i) a cylindrical body, said body comprising a fixed and a moveable threaded portion, said portions being relatively oppositely threaded, wherein said moveable portion has at one end means for removably mounting said stem;

ii) means structurally cooperating with said fixed portion for rigidly securing said fixed portion to said equipment;

iii) an elongated valve stem slideably engaged to said moveable portion; and,

iv) a double-ended threaded element correspondingly threadably engaged to said fixed and moveable threaded portions, said double-ended threaded element having a socket formed in its top portion for rotatably adjusting the moveable portion relative to the fixed portion thereby correspondingly axially displacing the valve stem from a first to a second position.



b) disengaging said valve stem from said adjustable valve apparatus;

c) inserting a new or replacement valve stem in said adjustable valve apparatus

d) reinserting said adjustable valve apparatus and stem in said machine assemblage; and,

e) rotating said threaded element to adjust the length of said valve stem so that said stem will properly engage the workpiece.

5,183,070

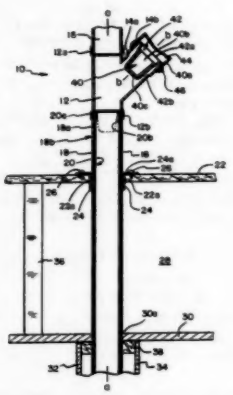
FIRESTOP DEVICE FOR FLAMMABLE FLOOR CONSTRUCTION

Kenneth R. Cornwall, 4963 Springfield Dr., Dunwoody, Ga. 30338

Filed Apr. 29, 1991, Ser. No. 692,669

Int. Cl.[5] F16K *17/14*

U.S. Cl. 137—75 **22 Claims**



1. An improved firestop stack fitting assembly which prevents the spread of smoke and fire through a building and through an opening in a floor of the building consisting of sheet material mounted on an upper end of floor joists and through a flame resistant ceiling mounted on a lower end of the floor joists below the floor, the stack fitting comprising:

(a) a fluid carrying main conduit means having a first longitudinal axis between two opposed openings;

(b) an extension conduit means extending from the main conduit means and positioned with a second axis at an acute angle from the longitudinal axis of the main conduit means with an opening;

(c) a non-flammable plug means mounted in the extension conduit means on a flammable support means provided in the extension conduit means which plug means is releasable by melting the flammable support means upon exposure of the support means to heat less than necessary for heat destruction of the main and extension conduit means from a fire in the building to thereby move the plug means into the main conduit means;

(d) a closure means for the opening of the extension conduit means;

(e) a flammable pipe means connected to a lower one of the openings of the main conduit means below the plug means and the extension conduit means, the pipe means having spaced apart openings defining an inner surface and an outer surface of a wall along the first axis of the main conduit means, the pipe means adapted to be mounted through the opening in the floor of the building and through the ceiling below the floor;

(f) a non-flammable insert means mounted inside the pipe means and held in place by a retention means, the insert extending from the lower one of the openings in the main conduit through the floor and having spaced apart openings defining an inside diameter along the first axis and having an outside surface of a wall mounted adjacent to the inner surface of the pipe means, wherein a fire in the building is prevented from spreading above the floor through the pipe means mounted through the floor by the insert means which seals off the inner surface of the pipe means from oxygen and by the plug means which releases from the extension conduit means to move into and plug an upper one of the openings of the insert means.

5,183,071

COUNTERBALANCE VALVE

Kazunori Ogawa, Gifu, Japan, assignor to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Dec. 13, 1991, Ser. No. 806,363

Claims priority, application Japan, Dec. 18, 1990, 2-411497

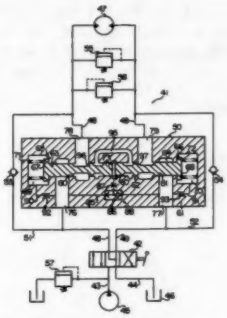
The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

Int. Cl.[5] F15B *13/04*

U.S. Cl. 137—106 **1 Claim**

1. A counterbalance valve comprising a spool which is divided into two spool pieces at the center in an axial direction thereof, return springs for urging the spool pieces inwardly along the axial direction toward innermost positions, a first passage for introducing an inside pressure in a supply and exhaust passage to an outermost end in the axial direction of one of the spool pieces, a second passage for introducing an inside pressure in another supply and exhaust passage to an outermost end in the axial direction of the other spool piece, a pressure selecting means for selecting higher inside pressure among the inside pressures in the supply and exhaust passages and for introducing the selected pressure to a pressure chamber formed between the spool pieces, and a communication pas-

sage means for communicating the supply and exhaust passages with each other when both the spool pieces are moved out-



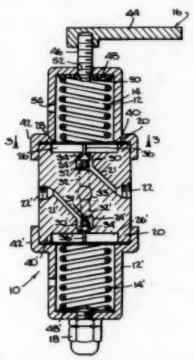
wardly in the axial direction from the innermost positions due to fluid in the pressure chamber.

5,183,072

AUTOMATIC SWITCHOVER VALVE

Rudolf Pengler, Weehawken, N.J., assignor to Matheson Gas Products, Inc., Secaucus, N.J.

Filed Oct. 21, 1991, Ser. No. 779,825
Int. Cl.[5] F16K *11/20;* **G05D** *16/06*
U.S. Cl. 137—113 **2 Claims**



1. An automatic switchover valve, comprising:

a main body including first and second regulator valves formed therein, each regulator valve including an inlet port, a diaphragm and poppet valve assembly, and an outlet port, wherein the main body includes internal ducting which couples the regulator valve inlet ports to respective switchover valve inputs for connection to separate sources of gas, and couples the regulator valve outlet ports in common to a single switchover valve output, and wherein said ducting coupled to said switchover valve output comprises a channel formed in said main body between a diaphragm chamber of said second regulator valve, and provides fluid communication therebetween;

means for selectively adjusting the poppet valve of said first regulator valve between a first setting providing a first regulator pressure P_1 and a second setting providing a second regulator pressure P_2 less than P_1;

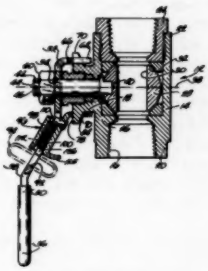
means for setting said second regulator valve to a reference regulator pressure P_R, wherein $P_1 > P_R > P_2$; and $P_1 - \Delta p = P_R = P_2 + \Delta p$.

5,183,073

HANDLE LOCKING MECHANISM FOR QUARTER TURN VALVES

John L. Roberts, West Milwaukee, Wis., assignor to Milwaukee Valve Company, Inc, Milwaukee, Wis.

Filed Apr. 2, 1992, Ser. No. 862,330
Int. Cl.[5] F16K *35/06*
U.S. Cl. 137—385 **16 Claims**



1. A rotatable control device including

a body housing a control means and having an external boss;

a control shaft journalled in said boss for rotation about an axis and having an internal portion connected to said control means and an external portion extending outwardly from said boss;

an operating handle having an inner end portion connected to the external portion of said control shaft, a gripping end portion for rotating said control means between first and second positions and an intermediate portion including an elongated slot;

first and second locking means circumferentially spaced on said body at locations corresponding to the positions of the intermediate portion of said handle when said control means is in the first and second positions, respectively;

a slider member slidably mounted on the intermediate portion of said handle for reciprocative movement between locked and unlocked positions, said slider member having opposed walls which overlay said slot;

interlocking means for cooperating with said first and second locking means, when said handle is in the first and second position, respectively, and said slider member is in the locking position, to restrain rotational movement of said handle; and

a spring disposed in said slot for biasing said slider member toward the locked position irrespective of the orientation of said handle, said spring being covered by and retained in said slot by the opposed walls of said slider member, having a first end bearing against the slider member and having a second end bearing against the intermediate portion of said handle.

5,183,074

PRESSURE-REDUCING VALVE, AND AIRCRAFT FUELING SYSTEM INCORPORATING THE SAME

James R. Reese, Vancouver, Wash., assignor to Cla-Val Co., Costa Mesa, Calif.

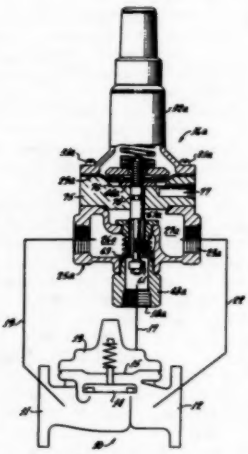
Filed Sep. 30, 1991, Ser. No. 769,125
Int. Cl.[5] G05D *16/00;* **F16K** *11/10*
U.S. Cl. 137—488 **22 Claims**

1. A pilot-operated pressure-reducing valve system, which comprises:

(a) a main valve having an inlet side, an outlet side, and means comprising a main-valve diaphragm and cover chamber to create a controlled reduced pressure of the fluid flowing out of said outlet side,

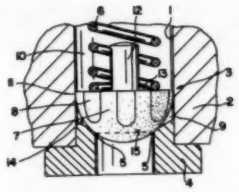
(b) a pilot valve body, said body having an inlet chamber and an outlet chamber separated from each other by wall means having an opening therein,

(c) a pilot diaphragm mounted on said pilot valve body,
(d) pressure regulating spring means to bias said pilot diaphragm toward said opening,
(e) means to adjust the force of said spring means to vary said reduced pressure,
(f) means to connect said inlet chamber to said inlet side of said main valve,
(g) means to connect said outlet chamber to said outlet side of said main valve,
(h) conduit means to connect said inlet chamber to said cover chamber in said main valve, said conduit means having a relatively large flow area so as to be able to conduct fluid at relatively high flow rates from said inlet chamber to said main-valve cover chamber,
(i) a first valve mounted in said pilot valve body to control the flow of fluid from said inlet chamber through said conduit means to said main-valve cover chamber, said first valve having a relatively large flow area so as to cooperate with said conduit means in effecting a relatively high flow of fluid from said inlet chamber to said main-valve cover chamber,
(j) a second valve mounted in said pilot valve body to control the flow of fluid from said main-valve cover chamber through said conduit means, and through said opening in said wall means, to said outlet chamber, said second valve being capable of moving independently of said first valve, and



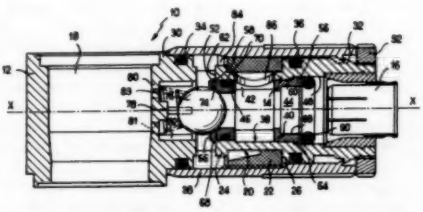
(k) means to effect operation of said first valve and said second valve by said pilot diaphragm, in such manner that when said pilot diaphragm is in a position relatively adjacent said opening said first valve is closed and said second valve is open whereby fluid flows out of said main-valve cover chamber to permit the upstream pressure at said inlet side to effect partial or complete opening of said main valve, and also in such manner that when said pilot diaphragm is in a position relatively remote from said opening said first valve is open and said second valve is closed whereby fluid from said inlet chamber passes through said conduit means to said main valve cover chamber at a rate that can be high so as to effect fast closing of said main valve,
said pilot diaphragm on the side thereof relatively adjacent said opening in said wall means being exposed to a control pressure related to that of fluid that has passed through said main valve.

5,183,075
CHECK VALVE
Günter Stein, Waihengeyerstr. 1, 8882 Lauingen, Fed. Rep. of Germany
Continuation of Ser. No. 314,870, Dec. 12, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 501,395
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1986, 3612393; Aug. 16, 1986, 3627865; Aug. 16, 1986, 3627865
Int. Cl.[5] F16K *15/04*
U.S. Cl. 137—493.6 **15 Claims**



1. A check valve including a valve body with a bore that serves as a flow passage, an inset ring (4) secured to said valve body, said inset ring having a flow passage coaxial with said flow passage in said valve body, said inset including a conical face which forms a conical valve seat along said conical face, a movable valve element which has a spherical surface portion that cooperates with said conical valve seat in a manner such that sealing is achieved, said movable valve element being installed in said valve body in a manner such that said movable valve element is radially guided at its upper end by a radial guidance zone inside said bore which bore extends in a direction of opening of said valve, said movable valve element contains axially aligned recesses in an outer surface portion therein for a medium to flow downstream through said axially aligned recesses away from said valve seat, said axially aligned recesses interconnecting medium flow regions upstream and downstream of the radial guidance zone, and said movable valve element being subjected to a force that acts in a closing direction, said movable valve element (3) being manufactured from a spherical ball, said movable valve element including a spherical surface portion (7) so that there is a radial line-contact of said movable valve element with the bore (1), and said recesses (8, 18) in said movable valve element for the medium flow extend along the spherical surface portion (7) between a zone which seats upon said valve seat (5) and the radial guidance zone (11) whereby fluid flows from said axially aligned recesses into said bore.

5,183,076
UNIDIRECTIONAL FLOW LIMITER
Daniel Guillin, Montsoult, and Michel Nicolas, Neauple Le Chateau, both of France, assignors to Telemecanique, Rueil-Malmaison, France
Filed Sep. 10, 1991, Ser. No. 757,172
Claims priority, application France, Sep. 14, 1990, 90 11412
Int. Cl.[5] F16K *21/02*
U.S. Cl. 137—513.7 **9 Claims**



1. In a unidirectional flow limiter, in particular for pneu-

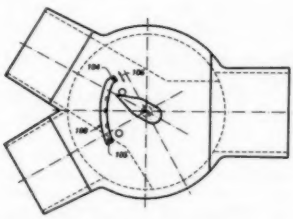
matic fluid, of the type having a tubular body, the ends of which have connecting means for connection to an installation and an item of equipment of the installation, said tubular body having passing therethrough an axial duct connecting said connecting means and passing through a valve seat which faces in the direction of the axial duct in which a closure ball is accommodated between the seat and an abutment element which is axially spaced from the seat, a by-pass duct connected to the axial duct on respective sides of the valve seat, a throttle ring being mounted rotatably on an external portion of the tubular body to modify the section of the by-pass duct, the improvement wherein the connecting means for connection to the item of equipment has a bore which is perpendicular to the axial duct for the passage of a screw member for fixing the tubular body to the item of equipment, and the seat for the ball is carried by an internal sleeve member secured to a portion of an internal bore in the tubular body, which bore constitutes a part of the axial duct and is larger than the diameter of the ball, said sleeve member being axially introduced into said bore after introduction of said ball.

5,183,077

FLOW CONTROL VALVE

Raymond Keiper, 1317 3rd St., North Catasauqua, Pa. 18032

Filed Dec. 9, 1991, Ser. No. 803,987
Int. Cl.[5] F16K *11/087, 5/10*
U.S. Cl. 137—625.47 **14 Claims**



1. A flow control valve comprising:

A) a body having a hollow, spherical central section, a first fluid conduit fluidically connected to said central section, a second fluid conduit fluidically connected to said central section, a third fluid conduit fluidically connected to said central section adjacent to said second fluid conduit, two stop elements mounted on top of said central section at locations spaced apart from each other;

B) a central body positioned within said central section, said central body being spherical and including a first fluid port located adjacent to said first fluid conduit said first fluid port being prolate and having two arcuate ends connected together by linear sections, a second fluid port spaced from said first fluid port, and fluid passage means fluidically connecting said first and second fluid ports; and

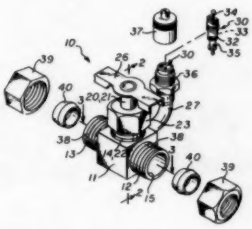
C) central body moving means which includes a post fixedly attached to said central body and extending out of said central section between said two stop elements, a control knob fixed to said post and having a portion that contacts one stop element when said central body is in a first orientation with said first fluid port in fluid communication with said first fluid conduit and said second fluid port in fluid communication with said second fluid port and contacts said second stop element when said central body is in a second orientation with said first fluid port in fluid communication with said first fluid conduit and said second fluid port in fluid communication with said third fluid port, said fluid ports and said fluid conduits being equal in cross section and being congruent when said central body is in either said first or said second orientation.

5,183,078

COMBINATION SHUT-OFF AND TEST-INJECTION VALVE

Harold E. Sorrell, 11311 Scottsdale, Stafford, Tex. 77477

Filed Jun. 24, 1991, Ser. No. 719,992
Int. Cl.[5] F16K *31/50*
U.S. Cl. 137—883 **11 Claims**



10. A combination shut-off and test-injection valve comprising;

a generally rectangular valve body having an externally threaded inlet end and outlet end configured to receive a compression nut and compression pinch sleeve for sealable connection to tubular fluid lines or conduit, a main fluid flow passageway extending from end to end, a valve chamber in fluid communication with said main fluid flow passageway and perpendicular thereto, and an outwardly extending tubular extension adapted at its outer end for connection to diagnostic and injection devices and having an interior fluid passageway in fluid communication with said body main fluid flow passageway at a location laterally spaced from said valve chamber to provide a test-injection passageway,

shut-off valve means in said valve chamber movable between an open position allowing fluid flow through said main fluid flow passageway from either end and a closed position closing off fluid flow through said main fluid flow passageway,

test-injection valve means in said tubular extension in fluid communication with said body main fluid flow passageway adjacent said shut-off valve means and having a spring biased plunger mechanism movable between a normally closed position preventing communication between said main fluid flow passageway and the exterior of said valve body and an open position allowing fluid communication between said main fluid flow passageway and the exterior of said body,

said shut-off valve means and said test-injection valve means being independently operable whereby said shut-off valve means may be operated to open or close fluid flow through said main fluid flow passageway and said test-injection valve means may be connected to test equipment and injection devices for diagnosing and cleaning the fluid system and components in the fluid line or conduit in which said valve body is connected.

5,183,079

HEAT AND FIRE RESISTANT PROTECTIVE COVERING FOR HOSES, CABLES AND THE LIKE

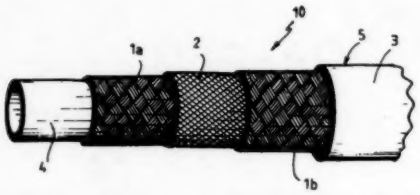
Philippe Blin, Monts, France, assignor to Hutchinson S.A., Paris, France

Filed Jul. 3, 1990, Ser. No. 548,142
Claims priority, application France, Jul. 5, 1989, 89 09034
Int. Cl.[5] F16L *11/12, 59/14*
U.S. Cl. 138—110 **4 Claims**

1. In combination with a hose of a covering thereon serving as a protective element capable of maintaining operation of the hose when exposed to high temperature of at least 850° C. for at least several minutes and while providing little change to the dynamic stiffness thereof, said covering comprising:

a first inner layer applied around and against said hose, said first inner layer being of braided construction and made of ceramic material and being so structured as to imprison air in its interior;

a first intermediate layer surrounding said inner layer and formed of a film of an air impermeable fire-resistant silicone elastomer material forming a barrier for the air imprisoned within said first inner braided layer of ceramic material;



a second intermediate layer applied against said first intermediate layer, on the outer surface thereof, said second intermediate layer also being of braided construction and also made of ceramic material and being so structured as to imprison air in its interior; and

an outer layer which covers said second intermediate layer, said outer layer being of a film of an air impermeable fire-resistant silicone elastomer material so as to form a barrier for the air imprisoned within said second intermediate braided layer of ceramic material.

5,183,080

SHED FORMING DEVICE FOR GRIFFE FRAMES

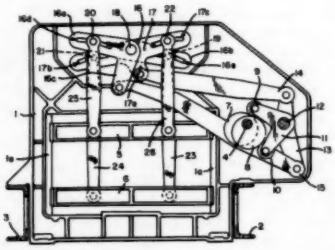
Dario Bassi, Chaponnay, and Joseph Palau, Duingt, both of France, assignors to Etablissements Staubli-Verdol, Chassieu, France

Filed Nov. 25, 1991, Ser. No. 797,078

Claims priority, application France, Nov. 27, 1990, 90 15140

Int. Cl.[5] D03C *3/36*

U.S. Cl. 139—55.1 **4 Claims**



1. In a shed-forming device for a weaving loom which includes a chassis having opposite sides and upper and lower griffe frames having opposite sides, and a control assembly for controlling the reciprocal movement of the upper and lower griffe frames relative to the chassis, the control assembly comprising, a first rotatable shaft, a pair of cams mounted to said first shaft, a second shaft spaced from said first shaft, an offset lever mounted on said second shaft, said offset lever having first and second arms operably engaged with said cams, a balance beam mounted to said second shaft and having opposite ends, first and second connecting rods having opposite ends, one of said ends of said first and second connecting rods being connected to opposite ends of said balance beam, a first rocking lever means having a pair of spaced and generally oppositely oriented arm portions, a second rocking lever means disposed between said arm portions of said first rocking lever means and having generally oppositely oriented arm portions, said first and second rocking levers being pivotally mounted about a first pin means, the other of said ends of said first connecting rod being connected to said first rocking lever means and the other of said ends of said second connecting rod being connected to said second rocking lever means, and articulating lever means for connecting said first and second rocking levers to one side of the upper and lower griffe frames.

5,183,081

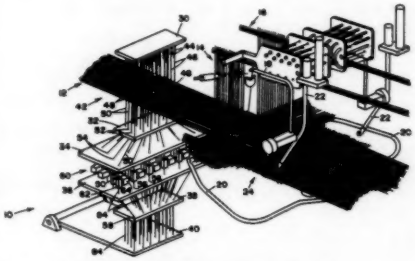
WEAVE SHED FORMATION APPARATUS FOR END REWEAVING TYPE JOINING APPARATUS

Heinz Kuster, and Stephan Kuster, both of Sandpoint, Id., assignors to Asten Group, Inc., Charleston, S.C.

Filed Feb. 7, 1992, Ser. No. 832,350

Int. Cl.[5] D03C *3/20, 13/00*

U.S. Cl. 139—59 **6 Claims**



1. A shed formation apparatus comprised of:

a plurality of movable heddles;

a plurality of heddle selectors which are equal in number to the heddles, each selector is connected to a respective heddle;

a plurality of controllers which are equal in number to the heddles, each controller having a guide, which receives a respective heddle selector, and stopper mechanism that retards the movement of the respective selector within the guide;

a plurality of control leads which are equal in number to the selectors, each lead is attached to a respective selector and all of the control leads are terminated on a common plane; and,

repeat pattern output means for controlling movement of the common plane and for selectively activating the stopper mechanisms in accordance with the repeat pattern.

5,183,082

FRAME STAVE FOR A HEDDLE FRAME

Hans Baumann, Horgen, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

Filed Nov. 26, 1991, Ser. No. 798,109

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1991, 4101512

Int. Cl.[5] D03C *9/06*

U.S. Cl. 139—92 **7 Claims**

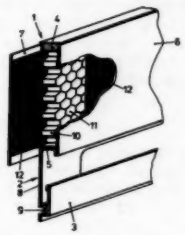
1. A frame stave for a heddle frame assembly, including a rectangular hollow body having two broad sides and two narrow sides, and including a heddle carrying rod extending at a distance from and parallel to one of said narrow sides, which heddle carrying rod is rigidly mounted to said hollow body via a supporting member;

comprising two thin walled sheet metal members which form said broad sides of the hollow body;

a massive longitudinal bar of a substantially square cross section forming one of said narrow sides and welded inbetween said two thin walled sheet metal members;

a multiply angled profile bar forming the supporting member for said heddle carrying rod of which a leg forming

the other of said narrow sides is also welded inbetween said two thin walled sheet metal members, which profile bar is of a sheet metal which is several times thicker than the sheet metal of said thin walled sheet metal members;



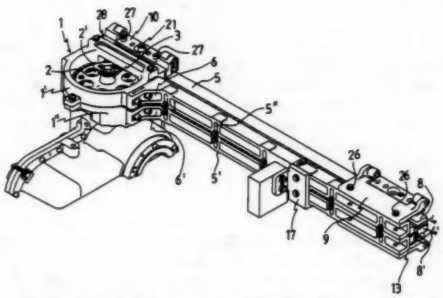
and said heddle carrying rod being integrally structured and welded to a further leg of said profile bar.

5,183,083

GRIPPER GUIDE FOR DOUBLE-GRIPPER WEAVING MACHINES

John Debaes, Wenduine, Belgium, assignor to N.V. Michel Van de Wiele, Kortrijk-Marke, Belgium

Filed Oct. 25, 1991, Ser. No. 782,648
Claims priority, application Belgium, Oct. 26, 1990, 09001026
Int. Cl.[5] D03D *47/18*
U.S. Cl. 139—449 **18 Claims**



1. Gripper guide for gripper weaving machines, comprising upper and lower drive wheels disposed at one side of first and second gripper bars, first and second guide strips extending along one side of each of the gripper bars, in a direction of motion of said gripper bars, and wherein at an opposite side of each of the gripper bars across from the drive wheels, first and second rollers are disposed such that the gripper bars are held between the rollers and the drive wheels, and parallel to the guide strips first and second slide strips are disposed such that the gripper bars can move to and fro between the guide strips and the slide strips while moving slidingly against the slide strips.

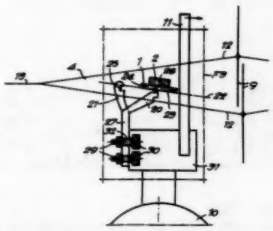
5,183,084

RAPIER GUIDE WITH TWO SERIES OF GUIDE ELEMENTS

Moeneclaey, Denis, Oostnieuwkerke-Staden, Belgium, assignor to Picanol N.V., naamloze vennootschap, Belgium

Filed Jul. 6, 1990, Ser. No. 549,083
Claims priority, application Belgium, Jul. 6, 1989, 08900738
Int. Cl.[5] D03D *47/00*
U.S. Cl. 139—449 **16 Claims**

1. A gripper weaving machine including rapiers, a shed having ends, a sley, and a reed, and comprising means including a rapier guide for guiding the rapiers in the shed, the rapier guide including means comprising two series of guide elements disposed along the shed for guiding the rapiers, means for situating a first of said series of guide elements closest to the reed to guide a side of the rapier situated closest to the reed, means for situating a second of said series of guide elements furthest from the reed to guide a side of the rapier situated



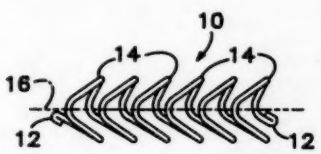
furthest from the reed, means for presenting each of said two series in the shed as the sley is moved backward, and means for situating at least every portion of the guide elements of the first series which are situated closest to ends of the shed underneath a plane formed by the undersides of the rapiers, in all positions of the sley.

5,183,085

METHOD AND APPARATUS FOR COMPRESSING A STENT PRIOR TO INSERTION

Hans Timmermans, 1100 SW. Curry, Apt. H, Portland, Oreg. 97201

Filed Sep. 27, 1991, Ser. No. 767,014
Int. Cl.[5] B21F *45/00*
U.S. Cl. 140—89 **10 Claims**



1. A method for compressing a helically coiled stent having an elongate axis that extends centrally through the coil, said method comprising:

(a) folding the coils of the stent about a first plane that contains the elongate axis of the stent;

(b) folding the coils of the stent about a second plane that contains the elongate axis and is normal to said first plane; and

(c) maintaining separation between the individual coils in the stent while performing said folding.

5,183,086

ENCAPSULATION METHOD FOR THE CONTAINMENT OF WASTE AND SALVAGEABLE PRODUCTS

David E. Fanta, Westlake, La.; Johnnie L. Hamby, Manvel, and Hart E. Schleicher, Houston, both of Tex., assignors to All-waste Services, Inc., Houston, Tex.

Continuation of Ser. No. 573,453, Aug. 27, 1990, abandoned.
This application Mar. 30, 1992, Ser. No. 863,499
Int. Cl.[5] B65B *1/12*
U.S. Cl. 141—10 **4 Claims**

1. A method for encapsulating waste materials, comprising the steps of:

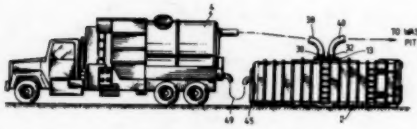
(a) positioning a substantially collapsed polyethylene liner having an open neck portion, into the interior of an en-

closed rigid container having an open neck portion and at least one openable side wall;

(b) extending the liner neck portion through the container neck portion and securing it thereto;

(c) positioning a first conduit and a second conduit through the container neck portion and into the liner;

(d) creating a negative pressure air flow between the container and the liner whereby the liner is inflated to fill the container and fit snugly in the interior of the container;



(e) creating a negative pressure air flow in the first conduit such that waste materials are drawn into the liner through the second conduit;

(f) removing the liner neck portion from the container neck portion;

(g) closing and sealing the liner neck portion; and

(h) at least one wall opening the openable side of the container and slidably removing the liner therefrom.

5,183,087

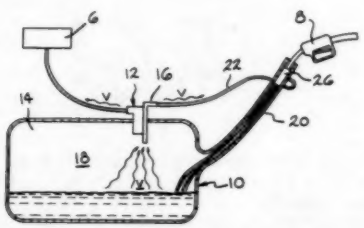
REFUELING VAPOR RECOVERY SYSTEM

John A. Aubel, Chandler, Ariz.; Jeffrey E. Devall, South Bend, Ind.; David R. Gimby, Livonia, and Philip A. Shipp, Rochester, both of Mich., assignors to Borg-Warner Automotive Electronic & Mechanical Systems Corporation, Sterling Heights, Mich.

Filed Jun. 10, 1991, Ser. No. 713,402

Int. Cl.[5] F16K *24/04*

U.S. Cl. 141—59 **9 Claims**



1. An apparatus for facilitating the control of vapor flow within the fuel system of a motor vehicle, such fuel system including a tank member defining a fuel storage chamber and a fill neck member engaged with said tank member and in communication with said fuel storage chamber, said apparatus comprising, in combination:

a vapor pressure relief valve engaged with the tank member and in communication with the fuel storage chamber, said relief valve including an outlet valve for venting fuel vapor from the fuel storage chamber, said outlet valve being normally biased to the closed position and a pilot valve for actuating said outlet valve in communication with said outlet valve, said pilot valve being normally biased in the open position;

a vent tube engaged with the tank member such that one end of said vent tube extends into the fuel storage chamber to a position equivalent to the maximum desired fill level of the fuel storage chamber, the opposed end of said vent tube being engaged with the fill neck member, whereby said vent tube provides a fuel vapor flow path between the fuel storage chamber and the fill neck;

and a cartridge member positioned in the fill neck, at a point proximate the engagement of said vent line with the fill neck, wherein said cartridge member engages a fuel nozzle upon insertion of the fuel nozzle into the fill neck to prevent fuel vapor from releasing to the atmosphere during the act of refueling;

whereby said cartridge member, said vent tube, and said vapor pressure relief valve operate in coordination during the act of refueling the tank to prevent the release of fuel vapor to the atmosphere and relieve the buildup of fuel vapor within the fuel system.

5,183,088

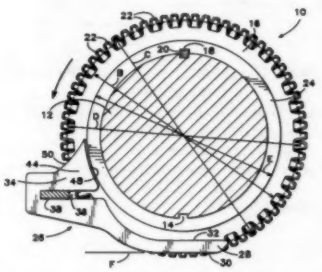
STRIPPER FOR WOOD INCISOR

Lloyd H. Toberg, 4339 SE. 87th, Portland, Oreg. 97266

Filed May 4, 1992, Ser. No. 877,771

Int. Cl.[5] B27M *1/02*

U.S. Cl. 144—2 J **5 Claims**



1. A wood incisor for forming a plurality of spaced-apart perforations in the surface of a piece of lumber preparatory to treatment of the lumber with a preservative, comprising:

(a) a drum that is rotatable about a central longitudinal axis;

(b) a plurality of annular incisor rings mounted on said drum for rotation therewith;

(c) a plurality of annual spacer rings, having an outside diameter, mounted on said drum for rotation therewith, said incisor rings being interposed between said incisor rings;

(d) said incisor rings including a series of spaced-apart teeth that project radially outward from the periphery thereof, said teeth having a predetermined depth extending between a base diameter, which is larger than the outside diameter of said spacer ring, and a tip diameter; and

(e) a plurality of hold-down bars, that do not rotate with said drum, one of said hold-down bars being located radially outward from each of said spacer rings, each hold-down bar having a planar outer surface that is substantially parallel with the tangent of a circular cylinder that is coaxial with said central longitudinal axis and has a diameter that is intermediate said base diameter and said tip diameter.

5,183,089

CHIPPER KNIFE ASSEMBLY

Norman E. Norlander, Puyallup, and Ralph A. Thompson, Auburn, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 28, 1992, Ser. No. 827,127

Int. Cl.[5] B26D *1/12*

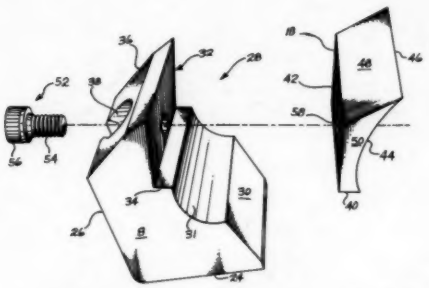
U.S. Cl. 144—231 **1 Claim**

1. A knife assembly for a chipping canter or similar device which comprises a removable knife holder means, a replaceable chipper knife means seated on said holder, a chipper head segment having at least one knife holder seat located on its periphery;

the knife holder having basal and rear surfaces angularly

disposed with respect to each other for engaging the holder seat, a front surface having three portions including a hold down surface, a concave arcuately shaped portion, and a portion for receiving and holding in place the replaceable knife means, said last portion having an opening therein to accommodate a portion of the holding means;

the replaceable chipper knife having basal and rear surfaces angularly disposed with respect to each other for engaging the receiving and holding portion in the knife holder, a front surface with a concave arcuate orientation terminating at a top knife edge and terminating along the bottom edge substantially in line with the arcuately shaped portion on the front surface of the knife holder, and a top surface extending rearwardly from the knife edge to meet the top edge of the rear surface;



the replaceable chipper knife holding means further including a bolting means extending through the top portion of the knife holder to engage a threaded portion within the rear surface of the knife, said bolting means being seated, when tightened, within the upper portion of the rear surface.

5,183,090

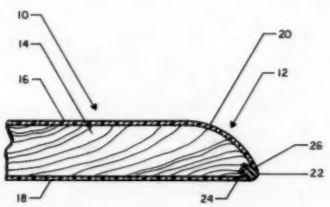
PANEL EDGE CONSTRUCTION

Duane G. McClung, Kalamazoo, and Thomas C. Mueller, Grandville, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Division of Ser. No. 584,130, Sep. 18, 1990, Pat. No. 5,085,027. This application Nov. 12, 1991, Ser. No. 791,082

Int. Cl.[5] B27D *1/00*

U.S. Cl. 144—350 **9 Claims**



1. A method of forming a laminated panel having a generally rounded edge terminating in a very small radius, said method comprising the steps of forming a core with a surface and an adjacent edge, forming a channel in said core edge in alignment with the intended position of said very small radius of the generally rounded edge, placing a plug in said channel, bonding a thin veneer layer to said surface of said core with said layer having an edge terminating at said plug, and then machining said very small radius on said plug to form a smooth outer surface between said veneer layer and said plug.

5,183,091

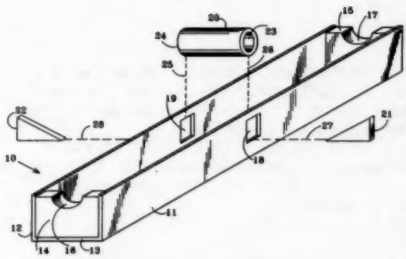
WOODEN POLE BENDER

Paul J. Nobbe, 11177 U.S. Hwy. 52, Brookville, Ind. 47012

Filed May 1, 1992, Ser. No. 877,643

Int. Cl.[5] B27H *1/00*

U.S. Cl. 144—360 **17 Claims**



1. A method of permanently bending a green wooden pole to a final configuration comprising the steps of:

positioning a green wooden pole in a holding fixture;

locating the opposite ends of said pole at predetermined elevations;

forcing the center of said pole to an elevation past said elevations to bend said pole to the desired bent configuration;

heating said pole while bent to simultaneously kill living things foreign to but located in said pole while permanently setting said bent configuration in said pole; and,

removing said pole from said holding fixture.

5,183,092

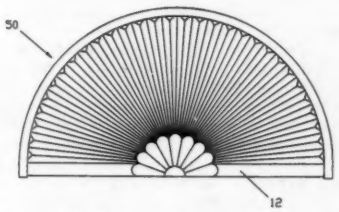
CORDING DESIGNS FOR OPERABLE ARCH WINDOW BLIND

Ralph Jelic, Valencia, Pa., assignor to Verosol USA Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 683,866, Apr. 11, 1991. This application Sep. 18, 1991, Ser. No. 761,697

Int. Cl.[5] E06B *9/06*

U.S. Cl. 160—84.1 **6 Claims**



1. In a window blind that has an elongated traveling bar and an elongated fixed bar, an arcuately collapsible pleated blind panel, one side of said panel being attached to said traveling bar and another side of said panel being attached to said fixed bar, a pivot means connected to the bottom end of each said bar so that said traveling bar may move angularly relative to said fixed bar, and a track for carrying said traveling bar, said track having a channel running therethrough, a system for effectuating the arcuate movement of said traveling bar through said track comprising:

a flat, elongated position slide having a cord tie off hole at one end and an elongated slot at the other;

a means for moveably attaching said position slide to a mounting face of said traveling bar so that the cooperation of said elongated slot and said fixing means allows said position slide to move back and forth in a predetermined

amount across said mounting face, said position slide being placed at an end of said traveling bar opposite from said pivot means and being oriented with said cord tie off hole facing away from said pivot means; and

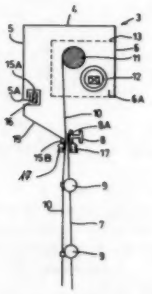
an elongated cord connected to said position slide at said cord tie off hole and having a knot at some distance from said position slide, said cord and said knot traveling within said track channel.

5,183,093

REMOVABLE SEALING DEVICE FOR A RAISABLE-CURTAIN INDUSTRIAL DOOR

Bernard Kraeutler, Dunieres, France, assignor to Nergeco (société anonyme), Dunieres, France

Filed Mar. 4, 1992, Ser. No. 845,613
Claims priority, application France, Mar. 5, 1991, 91 02587
Int. Cl.[5] E06B *9/06*
U.S. Cl. 160—84.1 **9 Claims**



1. A sealing device for a raisable-curtain industrial door, the door comprising a curtain and a rigid frame, the curtain being raised and gathered at a top of the door when in an open condition, and hanging down from the top of the door, when in a closed condition, said frame comprising two vertical lateral uprights (1,2) interconnected at their top ends by a downwardly-open channel-section cross-member (3) having a web (4) and two flanges (5,6) extending downwards to respective bottom edges, and said cross-member housing mechanical members for operating the curtain, and said curtain having a top portion and being capable of being lowered or raised between the uprights, wherein the top portion of the curtain is situated at a certain distance below the web of the cross-member, and a horizontal cover member (15;35) having parallel longitudinal top and bottom edges removably fastened at said top edge to a bottom edge of one of the flanges of the cross-member, and oriented such that the bottom edge (15B;22;36) of the cover member bears against the top portion of the curtain when in the closed condition to provide a continuous horizontal closure between the cross-member and the curtain when said curtain is in the closed condition to prevent air flow through the cross-member, and to enable ready access to the mechanical members upon removal of the cover member.

5,183,094

SUN SHIELD ASSEMBLY

Mani Montasham, and Hamid Gharagozloo, both of 7896 SW. 106 Cir., Miami, Fla. 33173

Filed Dec. 13, 1991, Ser. No. 808,172
Int. Cl.[5] B60J *3/00*
U.S. Cl. 160—370.2 **5 Claims**

1. To be sued to protect the interior of a vehicle from direct sunlight, a sun shield assembly comprising:

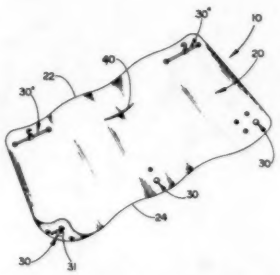
a flexible, opaque material panel,

said panel including an upper portion and a lower portion, and being structured and disposed to substantially cover an interior window surface of the vehicle,

upper attachment means disposed at opposite upper corners of said panel,

said upper attachment means including a pair of hook and bar assemblies secured to said panel in substantially spaced apart relation from one another, each of said hook and bar assemblies being structured and disposed to hook onto a sun visor assembly of the vehicle,

each of said hook and bar assemblies including a rigid bar secured at opposite distal ends thereof to said panel, each of said hook and bar assemblies further including a swivelable hook adapted to supportably hook onto the sun visor assembly of the vehicle,



each of said swivelable hooks being hingedly secured to a sliding cylinder, said sliding cylinder being movably positioned over said rigid bar for movement between said opposite distal ends of said bar such that said and hook and bar assembly is adjustably securable in vehicles of varying sizes and configurations,

lower attachment means disposed along said lower portion of said panel, said lower attachment means being structured and disposed to be affixed to the inner window surface of the vehicle, and

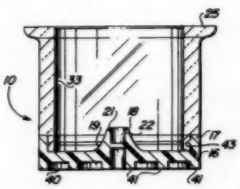
said lower attachment means including a plurality of adjustment positions such that said panel may be adjusted to fit over windows of a variety of sizes.

5,183,095

MEANS FOR PRODUCING HIGH PRECISION CASTINGS

Michael R. Sullivan, 1620 East La Donna La., Tempe, Ariz. 85283

Filed Nov. 30, 1990, Ser. No. 621,280
Int. Cl.[5] B29C *33/52, 39/26*
U.S. Cl. 164—34 **10 Claims**



1. An assembly for producing high-precision molds for use in the preparation of lost wax castings, said assembly comprising: a casting ring; a preselected wax form, and a base member, said casting ring and said base member each being formed of a transparent resilient plastic material, said base member having form support means disposed therein for receiving and holding said preselected wax form thereupon, said casting ring having a body portion, a depending flange portion integrally formed with said body portion and inset therefrom to define a planar

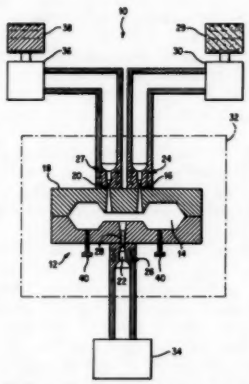
surface therebetween, and a peripheral groove defined in said flange portion in spaced generally parallel relationship to said planar surface, said body portion having an upper edge and an upper flange portion integrally formed with said upper edge and extending outwardly therefrom, said upper flange having a plurality of pin receiving means defined therein for securing another assembly thereto, said base member receiving and securing a portion of said casting ring therein in sealed engagement therewith to form a vessel therewith, said vessel being responsive to absorb the exothermic expansion of an investment solution disposed in said vessel while said investment solution is curing about said preselected form.

5,183,096

METHOD AND APPARATUS FOR SINGLE DIE COMPOSITE PRODUCTION

Arnold J. Cook, 372 N. Craig St., Pittsburgh, Pa. 15213

Filed Mar. 15, 1990, Ser. No. 493,933
Int. Cl.[5] B22D *19/14*
U.S. Cl. 164—97 **18 Claims**



1. A method for producing a metal matrix composite within a single die cavity comprising the steps of:

forcing a reinforcement material mixed with a liquid binder into the die cavity from a first port extending into the die cavity;

removing the binder such that the reinforcement material having interstices disposed about remains in the die cavity;

forcing liquid metal into the die cavity from a second port extending into the die cavity such that the metal infiltrates the interstices about the reinforcement material;

solidifying the liquid metal; and

removing the infiltrated composite material from the die cavity.

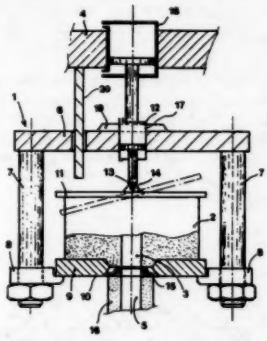
5,183,097

EQUIPMENT INSTALLATION FOR POSITIONING AND CLAMPING FOUNDRY MOLDS

Daniel Boudot, Saint-Remy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Aug. 27, 1991, Ser. No. 750,350
Claims priority, application France, Aug. 27, 1990, 90 10799
Int. Cl.[5] B22D *18/04*
U.S. Cl. 164—306 **7 Claims**

1. A dismountable positioning and clamping equipment installation for foundry molds (2) designed to implement the bottom casting of metal alloy at a casting station proximate to a metal alloy supply ladle, said installation comprising: at least one mold-support frame (1), a sand mold having a melt passage (3) opening facing downwardly, a mechanism (4) for side-travel transfer of the frame, at least one substantially vertical suspension jack (18) mounted to the transfer mechanism, and at least one substantially vertical clamping jack (12) mounted to the frame, the mold being adapted to be positioned over a casting spout (16) of a fusion apparatus, and the frame compris-



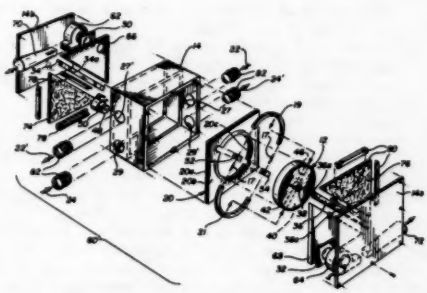
ing rotatably displaceable tappets (8) and at least one mold support plate (9), support surfaces of the tappets and a lower surface of the mold support plate lying in a single horizontal plane.

5,183,098

AIR TO AIR HEAT RECOVERY VENTILATOR

Catherine J. Chagnot, Athens, Ohio, assignor to Stirling Technology, Inc., Athens, Ohio

Continuation-in-part of Ser. No. 395,044, Aug. 17, 1989, Pat. No. 5,069,272. This application Mar. 7, 1991, Ser. No. 665,976
The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.
Int. Cl.[5] F28D *19/04*
U.S. Cl. 165—8 **34 Claims**



1. A heat recovery ventilator for ventilating rooms and buildings with minimum loss of heating or cooling, said heat recovery ventilator comprising:

a housing having first and second sections adapted to convey separate first and second streams of air, said housing further comprising a peripheral baffle secured to the inside of said housing, said peripheral baffle defining an aperture;

a heat exchanger disposed in said aperture, mounted for rotation within said aperture;

means for rotating said heat exchanger;

one or more seals communicating between said peripheral baffle and said heat exchanger, at least one of said one or more seals comprising a flexible seal, wherein said flexible seal is disposed in a groove in said peripheral baffle and extends from said groove into said aperture such that said flexible seal is disposed at least in part in said aperture around said heat exchanger; and

means for retaining said flexible seal in tension around said heat exchanger such that said flexible seal is retained in tension around the periphery of said heat exchanger;

whereby said flexible seal is place in tension and maintains a substantially air-tight seal between said heat exchanger and said peripheral baffle.

5,183,099

MOTOR VEHICLE WINDSHIELD WASHER SYSTEM

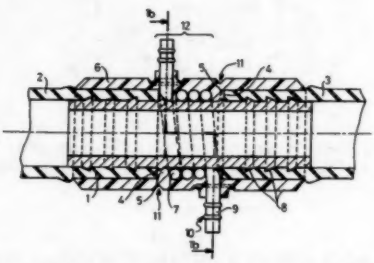
Jean-Pierre Bechu, Courbevoie, France, assignor to Caoutchouc Manufacture et Plastiques S.A., Versailles, France

Filed Feb. 28, 1991, Ser. No. 662,288

Claims priority, application France, Feb. 28, 1990, 90 02613

Int. Cl.[5] F28F *1/12*; B05B *1/10*

U.S. Cl. 165—41 **18 Claims**



1. A windshield washer system for a motor vehicle having an internal combustion engine with an engine coolant system for cooling the engine and for directing heated fluid to a heat exchanger, said coolant system having a plurality of coolant hoses and at least one connection device for connecting at least two of said coolant hoses, said windshield washer system comprising a hose arrangement for conducting windshield washer fluid to a windshield, said windshield washer system comprising:

said washer fluid hose arrangement being configured to interface with said coolant system at least at one of said at least one connection device;

said washer fluid hose arrangement comprising at least one heat exchanger coil for transferring heat from said coolant system to said washer fluid hose arrangement;

said coolant system comprising at least a first coolant hose end and a second coolant hose end;

at least one of said at least one connection device comprising an internal tube connecting at least said first coolant hose end and said second coolant hose end;

at least one of said at least one connection device comprising an external envelope disposed about said first coolant hose end, said second coolant hose end and said internal tube and over at least a substantial portion of each of said first coolant hose end and said second coolant hose end;

said at least one heat exchanger coil being disposed around said internal tube and being disposed adjacent said internal tube along a substantial length of said at least one heat exchanger coil;

a substantial portion of said at least one heat exchanger coil being substantially embedded within said external envelope;

said first coolant hose end and said second coolant hose end being held substantially within said external envelope;

said at least one heat exchanger coil comprising at least one coil body, each said at least one coil body being in the form of a spiral;

said external envelope having a central section between said first coolant hose end and said second coolant hose end;

said central section of said external envelope contacting said internal tube over a large surface area of said internal tube; and

said at least one coil body being completely embedded within said external envelope such that said external envelope is disposed substantially completely around said at least one coil body.

13. A method of making a windshield washer system hose connector for connecting sections of hose in an engine cooling system for a motor vehicle having a windshield washer system, which windshield washer system comprises an arrangement of windshield washer fluid hoses for providing windshield washer fluid to a windshield, the washer fluid hose arrangement being configured to interface with the coolant system at least at the hose connector, the washer fluid hose arrangement comprising at least one heat exchanger coil for transferring heat from the coolant system to the washer fluid hose arrangement, the coolant system comprising at least a first coolant hose end and a second coolant hose end, the hose connector comprising:

an internal tube having a first end and a second end, the internal tube connecting at least the first coolant hose end and the second coolant hose end;

an external envelope disposed about the first coolant hose end, the second coolant hose end and the internal tube;

the at least one heat exchanger coil being disposed around the internal tube and being disposed adjacent the internal tube along a substantial length of the at least one heat exchanger coil; and

a substantial portion of the at least one heat exchanger coil being substantially embedded within the external envelope;

said method of making the hose connector comprising the steps of:

disposing the at least one heat exchanger coil around the internal tube and adjacent the internal tube along a substantial length of the at least one heat exchanger coil;

mounting the first coolant hose end on the first end of the internal tube;

mounting the second coolant hose end on the second end of the internal tube;

the at least one heat exchanger coil being disposed between the first coolant hose end and the second coolant hose end;

placing the first coolant hose end, the second coolant hose end, the internal tube and at least a substantial portion of the at least one heat exchanger coil in a mold;

injecting a plastic material into the mold such that the plastic material flows:

between the turns of the at least one heat exchanger coil;

over a substantial portion of the at least one heat exchanger coil;

over at least a substantial portion of the first coolant hose end;

over at least a substantial portion of the second coolant hose end; and

about the internal tube; and

hardening the plastic material in the mold to hold the at least one heat exchanger coil, the first coolant hose end, the second coolant hose end and the internal tube substantially within the external envelope.

5,183,100

SYSTEM FOR EFFICIENTLY EXCHANGING HEAT OR COOLING GROUND WATER IN A DEEP WELL

James E. Harrell, Jr., P.O. Box 235, Wayne, Pa. 19087

Filed Feb. 14, 1991, Ser. No. 655,133

Int. Cl.[5] F24J *3/08*

U.S. Cl. 165—45 **17 Claims**

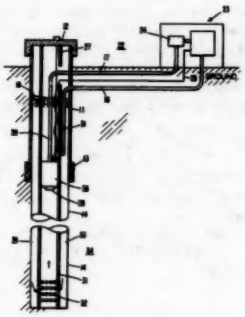
1. A ground water heat transfer system for a low cost high efficiency heat pump, comprising:

a deep well substantially filled with water having a wet open ground wall extending over the major portion of the well depth,

a concentric insulating sleeve extending from the bottom of said deep well to a distance above the water level positioned in the center of said water filled deep well for dividing the water in the well into two areas,

said insulating sleeve defining an open annular water path in the space between the outside of said insulating sleeve and said ground wall,

a water pump suspended in the top of said well having inlet means extending below said water level in said insulating sleeve, and



a return pipe connected to said water pump and having an open return outlet for discharging the water near the pump level in the top of the well in the space between said insulating sleeve and the ground wall surface of said deep well, whereby water returned to said space flows to the bottom of said deep well and into the bottom of said insulating sleeve so that the dynamic lift head of said water pump is negligible.

5,183,101

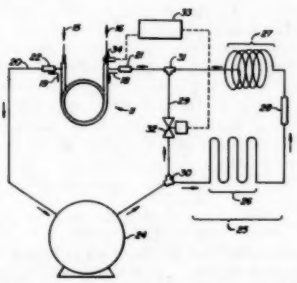
CIRCULATING CHILLER FOR ELECTRIFIED SOLUTIONS

William A. Penaluna, Pinole, and Charles W. Ragsdale, Concord, both of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed May 21, 1991, Ser. No. 703,445

Int. Cl.[5] F28F *21/00*; F25D *17/02*

U.S. Cl. 165—47 **9 Claims**



1. Apparatus for cooling an electrified buffer solution, comprising:

a shell-and-tube heat exchanger having tube-side and shell-side flow passages separated by corrosion-resistant heat-transfer tube material;

buffer circulating means for circulating said electrified buffer solution through said tube-side flow passage;

coolant circulating means for circulating coolant through said shell-side flow passage;

chilling means for chilling coolant thus being circulated, after its exit from said heat exchanger and prior to its reentry;

transfer tubing connecting said shell-side flow passage with said coolant circulating means and said chilling means; and

non-electrically-conductive couplings in said transfer tubing electrically isolating said heat exchanger from said coolant circulating means and said chilling means.

5,183,102

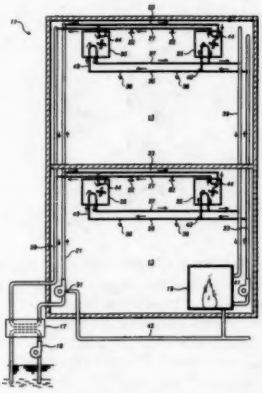
HEATING AND COOLING SYSTEM

Steven J. Clark, Belgrade, Mont., assignor to The Montana Power Company, Butte, Mont., a part interest

Filed Nov. 15, 1991, Ser. No. 792,863

Int. Cl.[5] F25B *29/00*; F24F *3/08*; A62C *35/58*

U.S. Cl. 165—48.1 **22 Claims**



1. A system for heating and cooling a building, said building having a first piping system that forms a fire sprinkler piping system and a second piping system forming a domestic hot-water piping system, said system for heating and cooling comprising:

water-cooling means for supplying and maintaining water in said first piping system at a first temperature;

domestic water-heating means for supplying water to said second piping system and for exclusively maintaining water in said second piping system at a second temperature; and

a plurality of fan-coil assemblies located throughout said building, said fan-coil assemblies able to access said water at said first temperature from said first piping system and also able to access said water at said second temperature from said second piping system, wherein each of said fan-coil assemblies includes air-circulating means and a first coil, said fan-coil assembly circulating air about said first coil, thereby transferring heat from the water in said first coil to the air if said first coil is accessing said water at said second temperature, and transferring heat from the air to the water in said first coil if said first coil is accessing said water at said first temperature.

5,183,103

HEAT EXCHANGER

Toshinori Tokutake, Oyamashi, Japan, assignor to Showa Aluminum Kabushiki Kaisha, Japan

Filed Oct. 28, 1991, Ser. No. 782,984

Claims priority, application Japan, Oct. 31, 1990, 2-295709

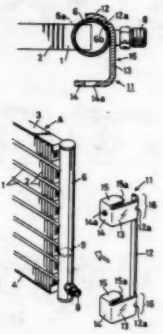
Int. Cl.[5] F28F *9/00*

U.S. Cl. 165—167 **11 Claims**

1. A heat exchanger comprising: a plurality of flat tubes; a pair of hollow headers connected to opposite ends of each flat tube in fluid communication with each tube; at least one fastener secured to a header; said fastener comprising a pair of

embracing portions capable of resiliently engaging the exterior of the header to keep the fastener in place prior to brazing the components of the heat exchanger together and a tie rod connecting the embracing portions together.

5. A heat exchanger comprising: a plurality of flat tubes; a pair of hollow headers connected to opposite ends of each flat tube in fluid communication with each tube; at least one fastener secured to a header; said fastener comprising at least one embracing portion capable of resiliently engaging the exterior



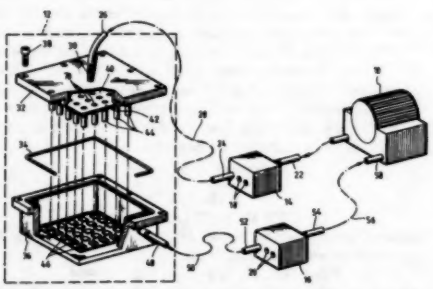
of the header to keep the fastener in place prior to brazing the components of the heat exchanger together, said embracing portion including a concave contacting member which extends along the header and contacts the exterior of the header; an extension protruding from a side edge of the concave contacting member; a tab integrally and perpendicularly extending from an extremity of the extension; and an ear protruding perpendicularly towards the header from an upper or lower edge of the tab, whereby a gap between the concave contacting member and a tip end of the ear receives the header.

5,183,104

CLOSED-CYCLE EXPANSION-VALVE IMPINGEMENT COOLING SYSTEM

Shlomo D. Novotny, Wayland, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 367,355, Jun. 16, 1989, abandoned.
This application Nov. 1, 1991, Ser. No. 798,821
Int. Cl.[5] H01L *23.467*; F25B *9/08*
U.S. Cl. 165—104.33 **14 Claims**



1. A closed-cycle expansion-valve gaseous-coolant-impingement element-cooling apparatus comprising:

a. a compressor for substantially compressing a gaseous-coolant, the compressor having an inlet and an outlet, the compressor arranged to substantially raise the temperature and pressure of the gaseous-coolant;

b. a first cooler coupled to the outlet of the compressor for cooling gaseous-coolant received from the compressor;

c. a cooling chamber that receives substantially compressed gaseous-coolant from the first heat exchanger and supplies expanded, substantially cooled gaseous-coolant by means of one or more expansion valves within the cooling chamber toward the elements to be cooled, the expansion valves serving to substantially lower the pressure of the gaseous-coolant and to lower the temperature of the gaseous-coolant to below ambient; and

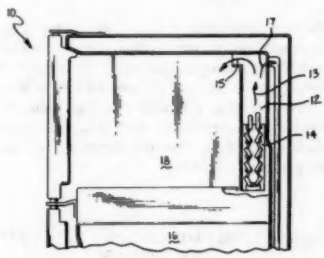
d. a second cooler coupled between the cooling chamber and the inlet to the compressor for cooling expanded gaseous-coolant received from the cooling chamber and returning the gaseous-coolant to the compressor.

5,183,105

OPPOSED CANTED EVAPORATOR

Michael B. Adams, Sylvania, Ohio, assignor to Brazeway, Incorporated, Adrian, Mich.

Filed Jul. 8, 1991, Ser. No. 726,992
Int. Cl.[5] F28D *1/47*; F25B *39/02*
U.S. Cl. 165—140 **6 Claims**



1. A heat exchanger comprised of a continuous tube for conveying a first fluid wherein the tube to exchange heat with a second fluid surrounding the tube, said tube having a plurality of reverse bends forming a plurality of parallel tube runs arranged in sets of two as determined by the respective reverse bends, each of the sets of two defining an entrance and an exit to the set, said tube folded into a tube bundle comprising two adjacent parallel spaced rows with each row comprising a plurality of successive sets of two runs with the exit of each set connected by a reverse bend to the entrance to the next successive set in the row, the tube runs in said bundle being arranged such that, when viewed in cross section, lines drawn between the centers of the tubes in each of the sets of two of one of said rows coact with lines drawn between the centers of the tubes in each of the sets of two in the other of said rows to form a herringbone pattern.

5,183,106

HEAT EXCHANGE

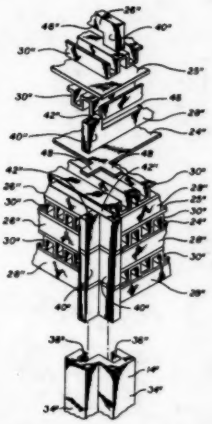
A. Colin Stancliffe; Paul Vidano, both of Redondo Beach, and Bill P. Pogue, San Pedro, all of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 24, 1992, Ser. No. 873,912
Int. Cl.[5] F28F *3/08*
U.S. Cl. 165—166 **9 Claims**

1. A heat exchanger of the bar-and-plate type; said heat exchanger including a plurality of stacked, spaced apart plate members separating interleaved in laterally spaced apart pairs with said plate members to space apart said plate members and to bound said heat exchange fluid streams at respective lateral margins of said heat exchanger, said pairs of bar members alternating to angular intersect in plan view at vertices of said plate members and including transecting end-extension portions; and an elongate corner bar member of double-U shape in cross section extending in the direction of stacking of said plate

members to defined a pair of channels opening in intersecting directions, said corner bar member captively receiving respective end-extension portions of said bar members into said channels to interlock therewith,

said end-extension portions of said bar members being generally L-shaped to also extend in said stacking direction and



defining confronting coplanar abutment surfaces within said channels of said corner bar members,

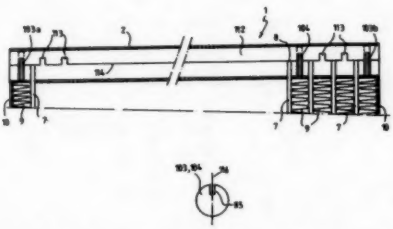
alternate plate members of said plurality of plate members also including cruciform extension portions at the vertices thereof, said cruciform extensions extending between said confronting coplanar abutment surfaces.

5,183,107

TUBULAR MANIFOLD FOR A HEAT EXCHANGER AND A METHOD OF MAKING IT

Philippe Le Gauyer, Paris, France, assignor to Valeo Thermique Moteur, Le Mesnil-Saint Denis, France

Filed May 6, 1992, Ser. No. 879,027
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—176 **9 Claims**



1. A heat exchanger comprising at least one fluid manifold having an elongated tubular wall, at least two transverse baffles carried by the said tubular wall, and a connecting member joining the said baffles together, the connecting member being of elongate shape extending in the axial direction of the tubular wall, the heat exchanger further comprising a multiplicity of heat exchange tubes, the tubular wall being formed with a multiplicity of apertures, each heat exchange tube being received in a respective said aperture so as to penetrate into the manifold, wherein the connecting member is a bar formed with a multiplicity of slots spaced apart along the said bar for receiving the said baffles, with each baffle comprising a further slot for receiving the said bar, the latter being substantially in contact with the tubular wall in a region of the latter diametrically opposed to the said apertures in which the heat exchange tubes are received.

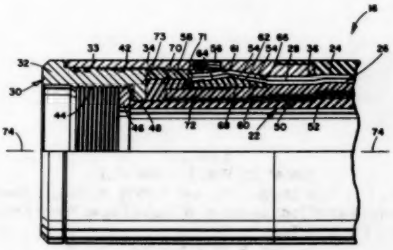
8. A method of making a heat exchanger according to claim **1**, including the steps of: fitting the transverse baffles on to the connecting member to form a sub-assembly; introducing the said sub-assembly into the tubular wall through an open end of the latter; causing the sub-assembly to slide longitudinally in the tubular wall until the baffles reach their final position; and subsequently introducing the ends of the heat exchange tubes into the fluid manifold through the said apertures in the tubular wall.

5,183,108

INFLATABLE PACKER

Albert H. Lee, Jr., and Carl H. Sabo, both of Wichita Falls, Tex., assignors to The Gates Rubber Company, Denver, Colo.

Filed Aug. 19, 1991, Ser. No. 747,042
Int. Cl.[5] E21B *33/127;* **F16J** *15/46*
U.S. Cl. 166—187 **34 Claims**



1. An inflatable packer comprising:

an elastomeric tubular body;

an outer cover surrounding said body;

an end member having a cap portion threadably engageable with an annular ring member, said ring member being secured to the end portion of a said outer cover;

a plurality of reinforcing elements sandwiched between said cover and said body and having end portions terminating beneath said ring member; and

means for wedging the end portions of said reinforcing elements against the inner surface of said ring member in response to increased threaded engagement between said cap portion and said ring member to retain said elements in position beneath said ring member.

5,183,109

METHOD FOR OPTIMIZING HYDRAULIC FRACTURE TREATMENT OF SUBSURFACE FORMATIONS

Don K. Poulsen, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 18, 1991, Ser. No. 781,523
Int. Cl.[5] E21B *43/267, 47/06*
U.S. Cl. 166—250 **20 Claims**

1. A method of optimizing a fracturing treatment of a subsurface formation comprising the steps of:

(a) injecting a volume of fluid into a wellbore penetrating said subsurface formation to generate a fracture in said formation;

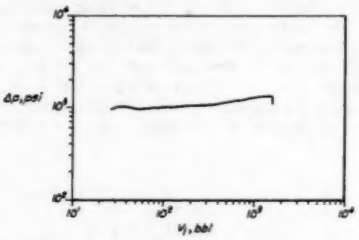
(b) measuring the pressure of the injected fluid in the wellbore over time;

(c) calculating the net pressure of the fluid in the wellbore over time;

(d) determining the volume of fluid injected into the wellbore over time;

(e) determining the slope of the logarithmic relationship

between the net pressure of step (c) and the injected volume of step (d);



(f) modifying the fracture treatment based upon predetermined interpretive guidelines of the slope determined in step (e).

5,183,110

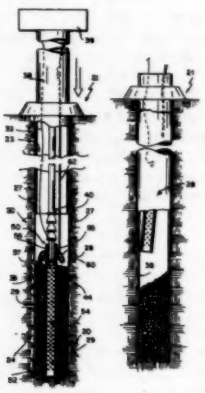
GRAVEL WELL ASSEMBLY

James D. Logan, Bargersville, and Jeffrey R. Bastin, Fountain Town, both of Ind., assignors to Bastin-Logan Water Services, Inc., Franklin, Ind.

Filed Oct. 8, 1991, Ser. No. 773,124

Int. Cl.[5] E21B *43/04, 43/08, 43/10*

U.S. Cl. 166—278 **10 Claims**



10. A method for regenerating a well having a ground pack encrusted with chemical deposits, the method comprising the steps of

inserting a slide tube into a well casing of the well to prevent infall of debris from native formations surrounding the bore of the well,

withdrawing a pump assembly for pumping groundwater from a bore of a well,

removing the gravel pack,

replacing the gravel pack, and

withdrawing the slide tube from the well casing of the well and replacing the pump assembly.

5,183,111

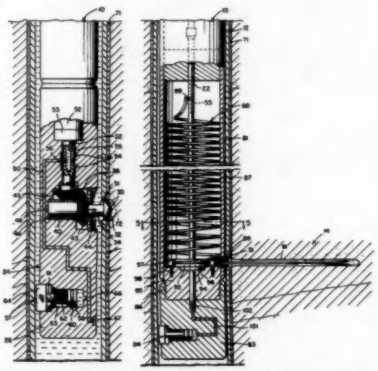
EXTENDED REACH PENETRATING TOOL AND METHOD OF FORMING A RADIAL HOLE IN A WELL CASING

Herman J. Schellstede, P.O. Box 208, New Iberia, La. 70560

Filed Aug. 20, 1991, Ser. No. 747,348

Int. Cl.[5] E21B *43/112, 7/18*

U.S. Cl. 166—298 **20 Claims**



17. The method of forming a radial hole in the casing of a well which extends into an underground formation consisting of the steps of lowering a tubing string into a well casing, anchoring the tubing string at a predetermined position in the well casing, extending a cutting element from the tubing string into engagement with the well casing while actuating the cutting element to form a hole in the casing and subsequently extending a formation penetrating tool from the tubing string through the hole in the casing into the formation to form a bore in the formation in a generally horizontal direction form the hole in the casing and retracting the penetrating tool and removing the tubular string from the casing to enhance production of fluid from the formation into the casing.

5,183,112

METHOD FOR SCALE REMOVAL IN A WELLBORE

James M. Paul, Dallas, and Richard L. Morris, Duncanville, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 16, 1991, Ser. No. 745,779

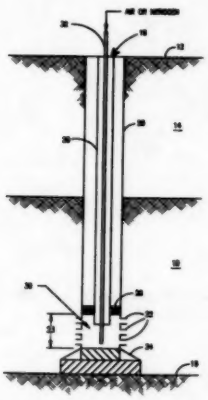
The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.

Int. Cl.[5] E21B *33/02*

U.S. Cl. 166—312 **10 Claims**

1. A method for removing alkaline earth scale within a well including the adjacent formation comprising contacting the scale within the well with a scale-removing solvent comprising an aqueous solution having a pH of about 10 to about 14 and

comprising a chelating agent comprising a polycarboxylic acid or salt of such an acid and a synergist anion to dissolve the



scale, the improvement comprising sparging the solvent with air or an inert gas to more effectively dissolve the scale.

5,183,113

DOWN-HOLE DECELERATORS

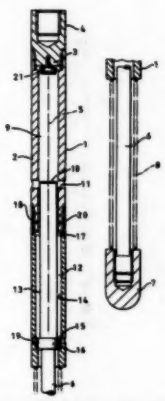
Peter A. Leaney, and Robert J. Smith, both of Cheltenham, England, assignors to Baroid Technology, Inc., Houston, Tex.

Filed Apr. 25, 1990, Ser. No. 514,424

Claims priority, application United Kingdom, Apr. 29, 1989, 8909938

Int. Cl.[5] E21B *17/07, 47/00*; F16F *5/00*; G01D *11/24*

U.S. Cl. 166—316 **17 Claims**



1. A down-hole decelerator for decelerating a device passed through a borehole, the decelerator comprising an elongate telescopic assembly having a longitudinal axis aligned with the axis of the borehole, the assembly comprising an elongate casing and a plunger slidable axially within the casing, the casing having one or more fluid passage openings through a wall of the casing, the casing and plunger defining a fluid storage chamber between an end of the plunger and an interior wall surface of the casing axially spaced from the plunger such that the axial length of the fluid storage chamber is decreased by the plunger moving inwardly of the casing, the plunger and casing further defining a fluid flow passage therebetween and extending from the fluid storage chamber to the one or more fluid passage openings for fluid flow out of the fluid storage chamber as the plunger moves inwardly of the casing, the fluid flow passage forming a substantially annular gap between the plunger and the interior wall surface of the casing, whereby the axial length of the substantially annular gap increases as the plunger moves inwardly of the casing to decelerate the device as a function of increased resistance to fluid flow through the axially increasing annular gap and then out the one or more fluid passage openings.

5,183,114

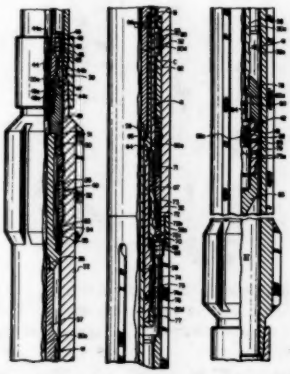
SLEEVE VALVE DEVICE AND SHIFTING TOOL THEREFOR

Howard R. Mashaw, Jr., Carrollton, and Robert C. Hammett, Garland, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 1, 1991, Ser. No. 678,812

Int. Cl.[5] E21B *34/10*

U.S. Cl. 166—319 **33 Claims**



1. A sliding sleeve valve for use in horizontal and highly deviated well conduits comprising:

(a) tubular housing means having a longitudinal through flow passage; said housing means including means thereon for centralizing said sliding sleeve valve within a well conduit, said centralizing means including

radial projections on the exterior of the tubular housing intermediate the ends thereof, and flow passages separating said radial projections;

(b) means for attaching said tubular housing means in a well conduit;

(c) longitudinal flow slots on the exterior of said tubular housing means intermediate the ends thereof;

(d) ports extending between said longitudinal flow slots and said longitudinal through flow passage for flow therebetween, each said port aligned with a flow slot; and

(e) means for controlling flow through said ports.

5,183,115

SAFETY VALVE

John C. Gano, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jul. 19, 1991, Ser. No. 733,134

Int. Cl.[5] E21B *34/08*

U.S. Cl. 166—319 **18 Claims**

1. A system for controlling flow in a well conduit comprising:

(a) a landing nipple in said conduit;

(b) a lock mandrel sealably engageable and releasably lockable in said landing nipple;

(c) a safety valve controlling production flow in said conduit

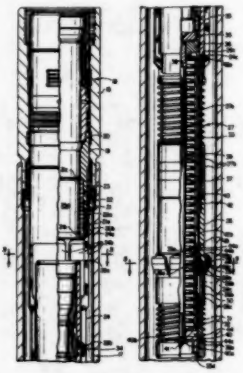
connected to said lock mandrel, said safety valve programmable for closure at various predetermined ratios of mass flow rate and ambient pressure and includes:

a housing having openings for flow between the outside and inside thereof,

a connector for connecting said housing to said lock mandrel,

an annular seat slidably and sealably mounted and releasably positioned in said connector,

valve member means slidably mounted in said housing, said valve member means moveable from open position permitting production flow through said housing openings to closed position where said valve member means sealingly engages said annular seat and prevents production flow through said openings, adjustable biasing means on said valve member means for biasing said valve member means toward open position,



variable flow restriction means on said valve member means forming an annular flow passage with said well conduit, said flow restriction means for varying the annular restricted flow passage area,

variable sensing means for automatically sensing ambient pressure and engaging said variable flow restriction means to vary said flow passage area for safety valve closure at the predetermined flow rate-ambient pressure ratio, said sensing means sealably engageable and releasably lockable in said valve member means; and

(d) means for connecting and disconnecting said safety valve to and from said lock mandrel.

5,183,116

VARIABLE PRESSURE REGULATOR FOR EXTENDED FIRE-EXTINGUISHING SYSTEM

William T. Fleming, Raleigh, N.C., assignor to Walter Kidde Aerospace, Inc., Wilson, N.C.

Filed Jul. 11, 1991, Ser. No. 728,358

Int. Cl.[5] A62C *3/08*

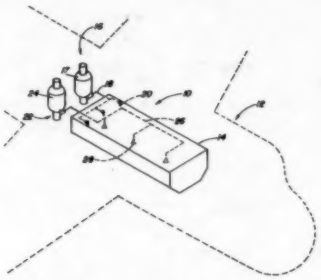
U.S. Cl. 169—43 **17 Claims**

1. An extended discharge system for discharging a fire-extinguishing material at a generally constant predetermined mass flow rate comprising:

(a) a container filled with the fire-extinguishing material;

(b) a discharge nozzle connected with the container for discharging the fire-extinguishing material into a protected space; and

(c) pressure regulating means for varying a pressure of the fire-extinguishing material passing from the container to the discharge nozzle as a function of an inlet pressure to the regulating means so as to produce a variable regulated pressure and the generally constant, predetermined mass flow rate of the fire-extinguishing material from the discharge nozzle irrespective of a temperature of the fire-extinguishing material.



5,183,117

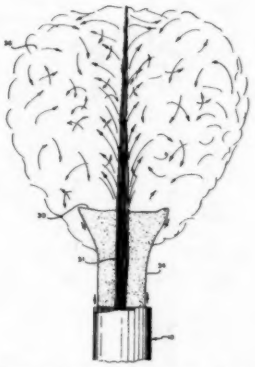
FIRE EXTINGUISHER

Edward Strickland, 4600 Nana Pl., Kaneohe, Hi. 96744

Filed Jun. 28, 1991, Ser. No. 723,374

Int. Cl.[5] A62C *3/06*

U.S. Cl. 169—46 **31 Claims**



1. A method of extinguishing a flaming fire in an elongated stream of oil and gas blowing from an oil well outlet that is positioned at a top of an oil well drilled into ground, said oil and gas stream flowing from said oil well outlet at a velocity consistent with an underground pressure in the well, said stream blowing into surrounding atmospheric air, said flaming fire being a ball having a base adjacent said outlet, said method comprising instantaneously freezing the flaming fire at the base of said ball, and then immediately and progressively enclosing a length of said elongated stream in a sheath that is impervious to said atmospheric air, said sheath progressing along the length of said stream at a velocity greater than the velocity of said stream as it issues from said outlet.

5,183,118

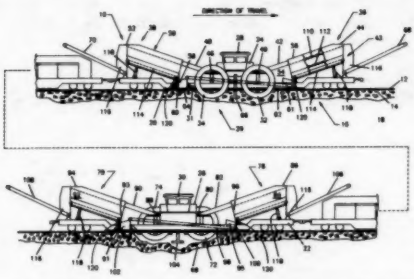
HIGH-CAPACITY BALLAST RECONDITIONING APPARATUS

John K. Kershaw, and Philip C. McCray, both of Montgomery, Ala., assignors to Knox Kershaw, Inc., Montgomery, Ala.

Continuation-in-part of Ser. No. 590,030, Sep. 28, 1990, Pat. No. 5,109,775. This application Oct. 31, 1991, Ser. No. 786,176

Int. Cl.[5] E01B *27/00*

U.S. Cl. 171—16 **17 Claims**



1. Apparatus for reconditioning ballast along a railroad bed having track supporting cross ties carried thereon comprising:

vehicular support means including a frame disposed for movement along said railroad bed, said vehicular support means having first and second sides;

first excavating means for excavating ballast from adjacent the ends and beneath said cross ties, said first excavating means comprising first and second excavating wheels mounted in spaced relation on said first side of said vehicular support means and disposed for driven rotation for excavating ballast from adjacent the ends of said cross ties, and first undercutter means mounted between said first and second excavating wheels for excavating ballast from beneath said cross ties to be picked up by said second excavating wheel of said first excavating means;

cleaning station means including at least first and second discrete cleaning stations mounted on said frame of said vehicular support means, said first cleaning station disposed for receiving and cleaning ballast excavated by said first excavating wheel, and said second cleaning station disposed for receiving and cleaning ballast excavated by said second excavating wheel and said first undercutter means; and

a first clean ballast conveyor means communicating with said first and second cleaning stations to receive said cleaned ballast from said first and second cleaning stations and for conveying said clean ballast back onto said railroad bed.

5,183,119

ANTI-SNAG PLOWING SYSTEM

Willard H. Wattenburg, Chico, Calif., assignor to Regents of the University of California, Oakland, Calif.

Filed Jun. 14, 1991, Ser. No. 714,907

Int. Cl.[5] A01D *15/00*; A01B *49/02, 43/00*

U.S. Cl. 171—105 **26 Claims**

1. An anti-snag plowing system, comprising:

(1) a rigid digging knife unit, comprising:

(a) a plurality of digging knives,

(b) a top bracket connected to the knives,

(c) at least two side brackets connected to the ends of the top bracket,

(d) a back bracket connected to the side brackets, whereby the top, side, and back brackets form a frame, and

(e) a basket connected to the frame for catching material turned up by the digging knives;

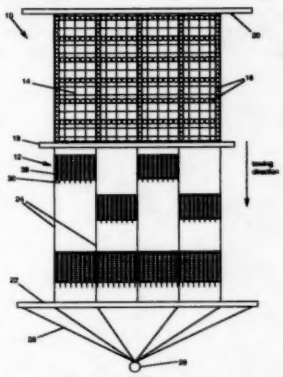
wherein the digging unit is situated between a towing means and a dragging means;

(2) said towing means connected to the digging unit, comprising:

(a) a draw bar,

(b) a plurality of side chains, extending longitudinally from the draw bar to the dragging means, each end of the top bracket being connected to a side chain, wherein the draw bar and top bracket are substantially parallel; and

(c) one or more cables connected to the draw bar for attachment to a moving vehicle;



wherein a towing force is applied to the towing means to tow the digging knife unit through a resistive medium that exerts a variable resistive force on the digging unit, whereby the digging unit rotates forward with respect to the direction of towing when the digging unit encounters an obstruction with a resistive force, and the digging unit tilts and passes over the obstruction, and wherein the top bracket has a streamlined surface for the resistive medium to flow over; and

(3) said dragging means connected to the side chains, comprising:

(a) a flexible harrow, and

(b) a blanket of reinforcing chains covering the top of the harrow.

5,183,120

LAWN CUTTING APPARATUS

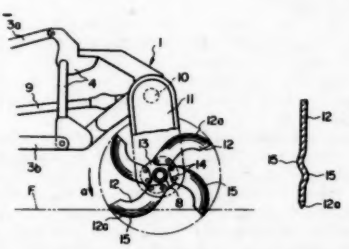
Hayataro Watanabe, Hachioji, Japan, assignor to Y.M. Golf Course Equipment Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1991, Ser. No. 762,995

Claims priority, application Japan, Jan. 21, 1991, 3-005822[U]

Int. Cl.[5] A01B *45/02*

U.S. Cl. 172—21 **1 Claim**



1. A lawn-ground cutting apparatus, wherein a plurality of cutting blades, each being in a substantial form of a promi-

nently curved broadax, each blade having an outer radius defining a cutting edge of each cutting blade, are mounted on a blade mounting shaft which is rotatably provided substantially parallel with a wheel axle of a self-propelling vehicle, the edge of each cutting blade facing in a rotational direction of the blade mounting shaft, and outwardly protruded ribs are provided on both lateral faces of each of the cutting blades in a substantially arcuate shape running substantially parallel to the edge of the cutting blade.

5,183,121

SUBMERSIBLE PNEUMATIC DRILLING UNIT

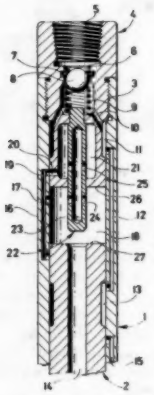
Vladimír Koudelka, Krivoklát, Czechoslovakia, assignor to Permon, státní podnik pan, Krivoklát, Czechoslovakia

Filed Oct. 16, 1991, Ser. No. 778,381

Claims priority, application Czechoslovakia, Nov. 9, 1990, 5525-90

Int. Cl.[5] E21B *1/00*

U.S. Cl. 173—206 **3 Claims**



1. A submersible pneumatic drilling unit, comprising:

a working cylinder having an inner wall, an upper end and a lower end;

a striking piston moveably mounted in said cylinder;

an upper lid closing the upper end of said cylinder and defining with said striking piston and upper working space in said cylinder, the upper lid having a storage space therein;

a drill bit holder connected to the lower end of said cylinder for holding a drill bit to be struck by said striking piston;

an upper filling duct extending in said working cylinder;

an anterior side duct in said working cylinder communicating said upper working space with said upper filling duct;

a posterior side duct in said working cylinder communicating said storage space in the upper lid with said upper filling duct;

an axial pin containing an axial duct therein, said axial pin extending in said storage space of said upper lid, and into said upper working space;

an anterior by-pass duct in said axial pin for communicating said axial duct in said axial pin with said upper working space;

a posterior by-pass duct in said axial pin for communicating said axial duct of said axial pin with the storage space of said upper lid; and

said upper working space forming a compression space between the inner wall of said working cylinder, an anterior face of said upper lid, an external surface of said axial pin, and a posterior face of said striking piston so that when said striking piston moves upwardly in said cylinder, pneumatic fluid in the upper working space moves through said anterior by-pass duct and through said interior side duct, into said storage space.

5,183,122

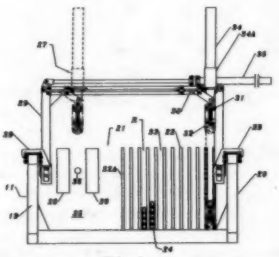
DERRICK ASSEMBLY CAPABLE OF CONVEYING PIPE SECTIONS BETWEEN A DRILL STRING AND A RACK FOR SAID PIPE SECTIONS

Ronald H. Rowbotham, Red Deer, and Gregory T. Cassady, Edmonton, both of Canada, assignors to Roll'n Well Servicing Inc., Red Deer, Canada

Filed Jul. 22, 1991, Ser. No. 733,876

Int. Cl.[5] E21B *7/02, 15/04, 19/14*

U.S. Cl. 175—52 **12 Claims**



1. A derrick assembly for raising or lowering a drill string made of interconnected pipe sections, comprising:

a derrick frame having lateral sidewalls and a base together defining an elongated channel having an open outer side opposite to said base;

a rack positioned within said channel adjacent to one lateral sidewall thereof leaving part of said channel clear for manipulating said drill string, said rack comprising at least one element extending between said base and said open outer side for housing pipe sections therebetween substantially longitudinally aligned within said channel;

a gantry extending across said open outer side of said channel, said gantry being movable longitudinally of said channel; and

a pipe gripping unit supported by said gantry for selectively holding or releasing pipe sections, said gripping unit being movable on said gantry towards or away from said base and laterally between said sidewalls;

whereby said pipe gripping unit may be manipulated on said gantry to transfer pipe sections between said rack and said clear part of said channel for attachment to or detachment from said drill string.

5,183,123

INDICATING MEANS FOR A ROCK BIT LUBRICATING SYSTEM

Kenneth M. White, Calgary, Canada, assignor to Western Rock Bit Company Limited, Alberta, Canada

Filed Dec. 26, 1991, Ser. No. 813,979

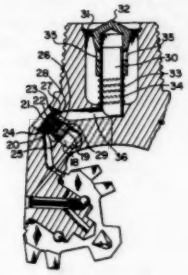
Claims priority, application Canada, Nov. 13, 1991, 2055399

Int. Cl.[5] E21B *10/24*

U.S. Cl. 175—228 **10 Claims**

1. A sealed lubricated rotary cutter rock drill bit having a lubricant reservoir connected via first passage means to bearing surfaces, the lubricant reservoir containing a valve controlling flow of a fluid along second passage means intersecting the lubricant reservoir, means for causing the valve to move as the lubricant in the lubricant reservoir depletes to cause a variation

in the pressure of the fluid in the second passage means whereby the amount of lubricant in the lubricant reservoir can



be gauged by monitoring the pressure of the fluid in the second passage means.

5,183,124

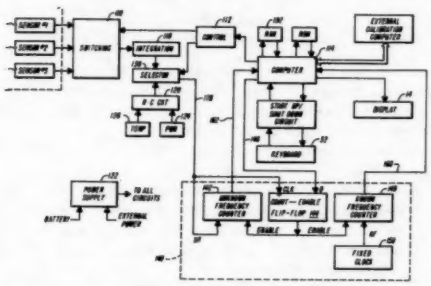
COMPACT SELF-ADJUSTING WEIGHING SYSTEM HAVING STABLE MEASUREMENT RESOLUTION

John Borchard, 97A Lowell Ave., Newton, Mass. 02160

Filed Sep. 7, 1990, Ser. No. 578,461

Int. Cl.[5] G01G *3/14*

U.S. Cl. 177—210 FP **26 Claims**



1. A self-adjusting weighing system, comprising:

at least one sensor means for sensing weight;

first circuit means for converting an output of the at least one sensor means to a signal having an unknown frequency;

second circuit means for providing a signal having a known frequency; and

similar period frequency measurement means including means responsive to the first and second circuit means for determining the frequency of the unknown frequency signal by counting a number of full cycles of the unknown frequency during a time frame over which a predetermined number of full cycles of the known frequency is counted.

5,183,125

LOAD-SENSING ELEMENT FOR A BALANCE

Michael Schurr, Murrhardt, Fed. Rep. of Germany, assignor to Soehnle-Waagen GmbH & Co., Murrhardt, Fed. Rep. of Germany

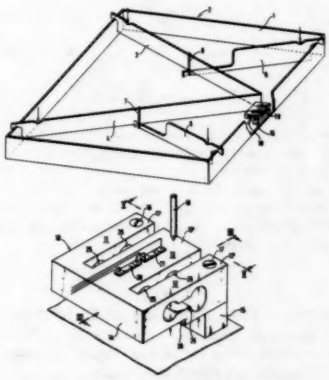
PCT No. PCT/EP89/00057, § 371 Date Jul. 11, 1990, § 102(e) Date Jul. 11, 1990, PCT Pub. No. WO89/07245, PCT Pub. Date Aug. 10, 1989

PCT Filed Jan. 19, 1989, Ser. No. 499,517

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1989, 3802153

Int. Cl.[5] G01G *3/14, 3/08;* G01L *1/22*

U.S. Cl. 177—211 **7 Claims**



1. A load-sensing element for a balance, comprising: at least one beam that receives a load at one end; and at least two strain gauges,

said beam including a horizontal opening defining reduced cross sectional areas of the beam on the top and bottom of the opening forming bending points connected by material forming a guide bar at the top of the opening and a guide bar at the bottom of the opening, the guide bar at the top of the opening being parallel to the guide bar at the bottom of the opening, wherein:

a strain gauge is disposed at each bending point associated with one of the guide bars, the strain gauges generating a measurement signal as a function of the load;

the other guide bar having a shoulder situated between its associated bending points, at which shoulder the cross section of the beam increases; and

the bending points associated with said other guide bar each defining a center line which are offset from one another by a predetermined amount.

5,183,126

WEIGHING SYSTEM AND FORCE TRANSMISSION

Arthur Kellenbach, 15 Awatea St., St. Ives, Sydney, Australia 2075

PCT No. PCT/AU89/00107, § 371 Date Nov. 20, 1989, § 102(e) Date Nov. 20, 1989, PCT Pub. No. WO89/08822, PCT Pub. Date Sep. 21, 1989

Continuation of Ser. No. 445,708, Nov. 20, 1989, abandoned.

This PCT application Mar. 17, 1989, Ser. No. 762,641

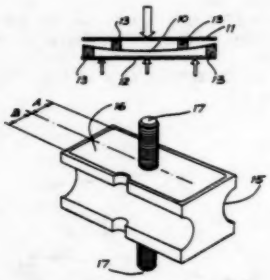
Claims priority, application Australia, Mar. 18, 1988, P17312; Aug. 18, 1988, P19967

Int. Cl.[5] G01G *3/14;* B32B *7/00*

U.S. Cl. 177—211 **15 Claims**

1. Bending beam weighing apparatus of the kind in which load and reaction forces are applied to a beam in equilibrium, said forces being applied to respective force transmission means spaced from one another in the longitudinal direction of

the beam, and in which is measured at a selected region of the beam the strain therein which arises from the bending of the beam by said forces and which is proportional to the distances between the location of said region and said force transmission means and between said force transmission means, wherein said load forces are applied to said beam by means of force



transmission means comprising a body of elastomer, said body being shaped as a rectangular prism, said elastomer being chosen such that in creep, hysteresis and linearity the characteristics of the body closely approximate those of an ideal spring, said body having upper and lower faces, and a pair of opposite side faces which are inwardly waisted between said upper and lower faces.

5,183,127

SUSPENSION-TRACTION TOTAL CONTROL SYSTEM

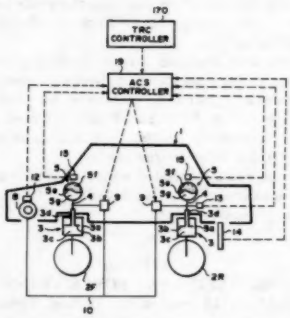
Fumio Kageyama; Hirotaka Kanazawa; Shin Takahara, and Toshiki Morita, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 581,572, Sep. 12, 1990, abandoned. This application Dec. 2, 1991, Ser. No. 799,895

Claims priority, application Japan, Sep. 13, 1989, 1-238181; Mar. 23, 1990, 2-74516

Int. Cl.[5] B60K *28/16*; B60G *21/00*

U.S. Cl. 180—197 **8 Claims**



1. A suspension-traction total control system for a vehicle comprising a traction control system which reduces driving torque for driving wheels of the vehicle when the driving wheels slip, with said traction control system controlling at least one of the engine and brakes for the wheels of the vehicle in order to reduce the driving torque, an active suspension system which has a cylinder disposed between the vehicle body and each of the wheels of the vehicle and in which suspension properties can be changed, a control means for controlling feed and discharge of the hydraulic fluid to and from the cylinders, and a control gain changing means which increases a control gain of the active suspension system when the traction control system is operating so that a flow rate of the hydraulic fluid is altered, wherein said control means includes a control system which suppresses the vehicle level displacement speed on the basis of vehicle level displacement speed signals which are obtained by differentiating outputs of vehicle level sensors provided for the respective wheels, the control gain of the control system being increased when the traction control system is controlling both the engine and the brakes and the value of a brake control variable is not smaller than a predetermined value.

5,183,128

APPARATUS FOR CONTROLLING THE OUTPUT OF A VEHICLE EQUIPPED WITH AN INTERNAL COMBUSTION ENGINE

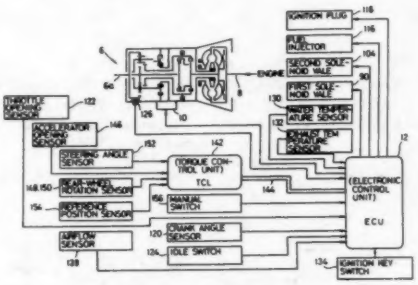
Masayoshi Ito, Okazaki; Kiichi Yamada; Katsunori Otake, both of Nagoya; Yasunobu Miyata, Komaki; Tomohiro Narita, and Susumu Nishikawa, both of Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1991, Ser. No. 661,295

Claims priority, application Japan, Feb. 27, 1990, 2-44466; May 18, 1990, 2-127008; May 18, 1990, 2-127015

Int. Cl.[5] B60K *28/16*

U.S. Cl. 180—197 **12 Claims**



1. An apparatus for controlling an output of a vehicle equipped with an internal combustion engine, comprising:

means for calculating a reference driving torque of the engine based upon a vehicle speed;

means for detecting a slippage of driving wheels of the vehicle;

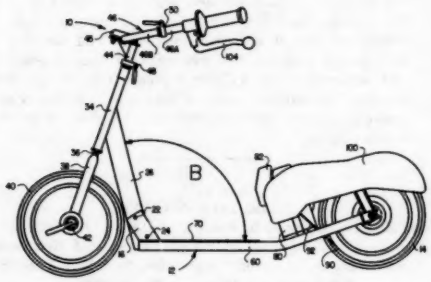
setting means for obtaining correction torques for the reference driving torque, said setting means including a first means for setting an integral correction torque as one of said correction torques based upon an integral value of said detected slippage;

limiter means for restricting said integral correction torque to a value of at least a negative lower limit when said integral correction torque has a negative value, said limiter means including means for reducing an absolute value of said negative lower limit in accordance with an increase of said vehicle speed;

determination means for determining a .arget driving torque of the engine, said determination means including correction means for obtaining a corrected reference driving torque by subtracting said restricted integral conrrection torque from said reference driving torque, and means for calculating said target driving torque based upon the corrected reference driving torque; and

controlling means for controlling an actual driving torque of the engine based upon said target driving torque.

5,183,129
COLLAPSIBLE SCOOTER
Robert M. Powell, Rte. 1, Box 1025, Quinlan, Tex. 75474
Filed Jun. 17, 1991, Ser. No. 716,085
Int. Cl.[5] B62D *61/00*
U.S. Cl. 180—208 **21 Claims**



1. A collapsible scooter comprising:

a lower frame having front and rear portions,

a front frame having upper and lower portions, said lower portion of said front frame being secured to said front portion of said lower frame in a manner to permit pivotal movement between said front and lower frames between an operative position in which said front frame extends at a first angle with respect to said lower frame, and a collapsed position in which said front frame extends at a second angle with respect to said lower frame, said lower portion of said front frame being pivotally secured to said front portion of said lower frame by an assembly comprising a pair of opposing braces extending upwardly from said front portion of said lower frame, said lower portion of said front frame extending between said braces, and a pivot pin secured between said braces, said lower portion of said front frame having a hole through which said pivot pin passes so that said front frame may pivot about said pivot pin between said operative position and said collapsed position,

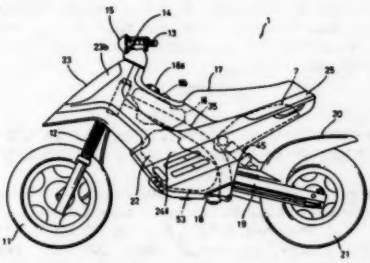
steering means secured to said upper portion of said front frame,

a front wheel secured to said steering means in a manner to permit angular rotation of said wheel relative to said front frame,

a rear wheel secured to said rear portion of said lower frame, and

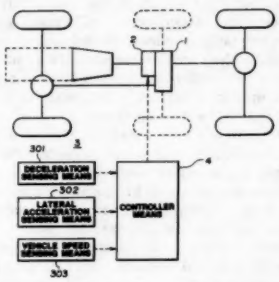
a locking pin for releasably locking said front frame relative to said lower frame in said operative position or in said collapsed position, said braces having corresponding, aligned holes formed therethrough through which said locking pin may be secured, and said lower portion of said front frame having first and second holes formed therethrough for receiving said locking pin so that said locking pin may be inserted through said holes in said braces and through said first hole in said lower portion of said front frame to lock said front frame in said operative position or so that said locking pin may be inserted through said second hole in said lower portion of said front frame when said front frame is in said collapsed position to lock said front frame in said collapsed position.

5,183,130
MUFFLER DEVICE FOR MOTORCYCLE
Michio Nakamura; Toshihiko Okunosono, and Tsuneo Kajikawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 25, 1990, Ser. No. 557,078
Claims priority, application Japan, Jul. 25, 1989, 1-192263
Int. Cl.[5] B60K *11/06*; B62D *61/02*; F01N *7/14*
U.S. Cl. 180—219 **14 Claims**



1. A motorcycle having a vehicle body frame mounting an engine, a muffler device and a cowl covering the front and side portions of said vehicle body frame, said muffler device comprising a muffler body and an air guide cover fully enclosing said muffler body in spaced relation thereto to define a cooling chamber between said muffler body and said air guide cover, said cooling chamber defining an air flow passage about said muffler body, and means for supplying cooling air under pressure to said air flow passage for forcibly cooling said muffler body, said muffler body and said air guide cover being located within and covered on the top and sides by said cowl.

5,183,131
SYSTEM FOR CONTROLLING DRIVE TORQUE DISTRIBUTING CLUTCH OF VEHICLE
Genpei Naito, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 19, 1991, Ser. No. 687,482
Claims priority, application Japan, Apr. 20, 1990, 2-104639
Int. Cl.[5] B60K *17/34*
U.S. Cl. 180—233 **16 Claims**



1. A driving torque distribution control system for a vehicle, comprising:

a torque distributing mechanism for dividing a driving torque between first and second drive wheels of the vehicle;

a torque distributing clutch means for varying a torque distribution between said first and second drive wheels by varying a clutch engagement force in response to a control signal, said torque distributing clutch means being provided between a driving torque input side and a driving torque output side of said distributing mechanism;

a sensor means for sensing a decelerating condition of the vehicle, a lateral acceleration of the vehicle and a vehicle speed of the vehicle and for producing sensor signals i.. 4icative of said decelerating condition, said lateral acceleration and said vehicle speed; and

a controller means for controlling said clutch engagement force of said torque distributing clutch means by producing said control signal in response to said sensor signals supplied from said sensor means, said controller means increasing said clutch engagement force in accordance with said lateral acceleration when the vehicle is decelerated, and increasing a rate of increase of said clutch engagement force with respect to said lateral acceleration when said vehicle speed increases.

5,183,132

POWER TRANSFER DEVICE HAVING CENTER DIFFERENTIAL GEAR FOR FOUR-WHEEL DRIVE VEHICLE

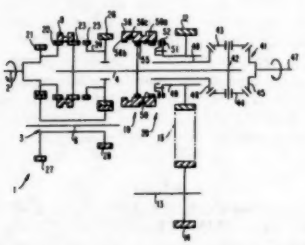
Mutsumi Fujisawa, Okazaki, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1990, Ser. No. 609,914

Claims priority, application Japan, Nov. 10, 1989, 1-130554[U]

Int. Cl.[5] B60K *17/352*

U.S. Cl. 180—247 **5 Claims**



1. A power transfer device having a center differential gear unit for use in a four-wheel drive vehicle comprising a rotary shaft to transmit the driving power of an engine;

said center differential gear unit is connected with said rotary shaft and distributes the driving power from said engine to front and rear road wheels of the vehicle;

an intermediate shaft which is connected with one of the output elements of said center differential gear unit, and which is rotatably provided around said rotary shaft, said intermediate shaft being connected with said rotary shaft through a first clutch mechanism in such a manner that said intermediate shaft can be connected with and disconnected from said rotary shaft, and

an output shaft which is rotatably provided around said intermediate shaft, and which is detachable connected with said intermediate shaft through a second clutch mechanism having a synchronizing mechanism in such a manner that the output shaft can be connected with and disconnected from said intermediate shaft;

wherein said first clutch mechanism is composed of a first hub having external teeth mounted on said intermediate shaft, a sleeve having internal teeth slidably spline connected to the teeth of said first hub, a second hub having external teeth mounted on said rotary shaft and which can be selectively engaged with and disengaged from said teeth of said sleeve;

said second clutch mechanism being composed of said first hub, said sleeve, and a clutch gear mounted on said output shaft, which can be selectively connected with and disconnected from said sleeve through external teeth of said synchronizing mechanism of said clutch gear;

wherein said first hub, said second hub, and said clutch gear are arranged with respect to the axis of said rotary shaft in the order of said second hub, said first hub, and said clutch gear;

said sleeve being movable between a first position in which said internal teeth of said sleeve engage with said external teeth of said first hub and said external teeth of said second hub;

a second position in which said internal teeth of said sleeve engage with said external teeth of said first hub and said external teeth of said synchronizing mechanism of said clutch gear; and

a third position in which said internal teeth of said sleeve engage with said external teeth of said first hub, said external teeth of said second hub, and said external teeth of said synchronizing mechanism of said clutch gear;

said sleeve having an internal annular groove, the width of which is greater than the width of said external teeth of said second hub, and within which said engagement teeth of said second hub are positioned when said sleeve is in said second position, and wherein said internal teeth of said sleeve extend by a distance greater than the distance between said external teeth of said second hub and said external teeth of said synchronizing mechanism of said clutch gear.

5,183,133

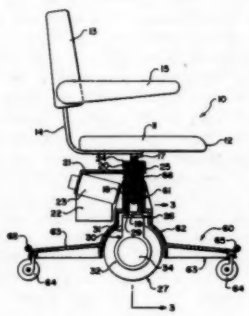
MOTOR-DRIVEN CHAIR

Orest Z. Roy; Raymond E. Fulford, and Jules O. Legal, all of Winnipeg, Canada, assignors to Canadian Aging & Rehabilitation Product Development Corporation, Winnipeg, Canada

Filed Mar. 13, 1991, Ser. No. 668,866

Int. Cl.[5] B60K *17/30*

U.S. Cl. 180—252 **12 Claims**



1. A motor-driven chair comprising a seat element having support surfaces for receiving and supporting an occupant of the chair, first wheel for running on the ground, means mounting the seat element above the first wheel so that the weight from the occupant is applied downwardly onto the wheel for support thereby, the first wheel having a horizontal axis of rotation defining a direction of forward motion lying at right angles to the axis with the orientation of the direction of forward motion being fixed relative to the seat element such that rotation of the seat element about a vertical axis rotates in the direction of forward motion about the vertical axis, an outrigger frame having a plurality of freely rotatable second wheels thereon at spaced positions around the first wheel, means mounting the outrigger frame on the seal element for rotation relative thereto about a vertical axis and for support of the seat element by the second wheels to prevent toppling of the seat element away from a position above the first wheel, a motor for driving the first wheel for rotation thereof about the horizontal axis, a battery for supplying power to the motor, means selectively actuable by the occupant to activate said motor, the seat element and the first wheel being mounted on a common support, means for rotating the seat element and the first wheel

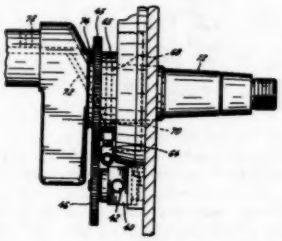
on the common support about a vertical axis relative to the outrigger frame so as to change the orientation of the seat element and the direction of forward motion relative to the outrigger frame and the ground, and means mounting the seal element, the first wheel and the common support relative to said outrigger means so as to allow vertical movement between the outrigger frame and the first wheel and spring biasing means arranged to bias the first wheel upwardly relative to the outrigger frame such that when the weight of the occupant is removed from the seat element, the spring means retracts the first wheel to a height above the second wheels to allow free rolling rotation of the chair on the second wheels.

5,183,134

LUBRICATION SYSTEM FOR AIR COMPRESSOR

Victor D. Kuc, Des Plaines, Ill., assignor to Triangle Engineered Products Co., Bensenville, Ill.

Filed Jan. 13, 1992, Ser. No. 820,086
Int. Cl.[5] F01M *1/00*
U.S. Cl. 184—6.16 **7 Claims**



1. A lubricant delivery system for use in an air compressor having an internal crankcase chamber accessible by removal of an inspection plate having inner and outer surfaces, the compressor having a rotatable crankshaft journaled in the crankcase and a sump in the crankcase for lubricating fluid, the delivery system comprising in combination,

a positive displacement fluid pump having inlet and outlet ports mounted in said internal crankcase chamber, said pump being driven through power transfer means operatively coupled to said crankshaft,

first delivery means for conveying fluid between the sump and said pump inlet port,

removable filter means for filtering the lubricating fluid and having an inlet and an outlet, said filter means being disposed exteriorly of the crankcase chamber and carried on the inspection plate, and second delivery means for conveying lubricant between said pump outlet port and said filter means inlet;

pressure relief means for relieving pressure above a set point, said pressure relief means having fluid entrance, exit and bypass openings adapted for fluid flow therethrough, said pressure relief means being interposed between the removable filter means and the outer surface of the inspection plate,

a distribution ring adapted to circumscribe said crankshaft and having an internal annular groove for introducing lubricating fluid to said crankshaft, and third delivery means for conveying lubricant from the exit of said pressure relief means to said annular groove, said pressure relief means fluidically interconnecting the outlet of said filter means and said third delivery means,

fourth delivery means associated with said crankshaft for conveying lubricating fluid from said annular groove to wear areas where lubrication is required, and

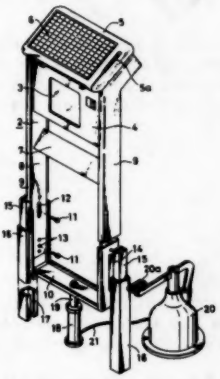
fifth delivery means for conveying lubricant from said pressure relief means bypass opening through said inspection plate and back to said sump.

5,183,135

APPARATUS FOR INPUTTING COMMODITY DATA

Yukuo Kurimoto; Nobuhiko Fujii; Mitunori Kohno, and Takao Umebara, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 378,773, Jul. 12, 1989, Pat. No. 5,083,637. This application Nov. 15, 1991, Ser. No. 792,625
Claims priority, application Japan, Jul. 12, 1988, 63-172895; Jul. 12, 1988, 63-172897; Jul. 12, 1988, 63-172898; Jul. 12, 1988, 63-172899; Jul. 12, 1988, 63-172900
Int. Cl.[5] G06K *7/10*
U.S. Cl. 186—61 **3 Claims**



1. An apparatus for reading commodity data, comprising:

a bar code scanner;

a keyboard rotatably mounted on an upper portion of said bar code scanner;

a frame for rotatably supporting at least said bar code scanner, said frame comprising first and second oppositely disposed supporting posts such that said bar code scanner is rotatably supported between said first and second supporting posts;

a connecting member for connecting lower portions of said supporting posts, said supporting posts being telescopically movably mounted to said connecting member so as to permit the relative movement of the supporting posts with respect to the connecting member, said supporting posts and said connecting member comprising means for selectively adjusting the height of said supporting posts with respect to said connecting member;

a lifting mechanism connected to said connecting member for vertically lifting said connecting member and said frame; and

a driving source for driving said lifting mechanism.

5,183,136

PIN BOOT FOR A DISC BRAKE

Kazuo Maeda, and Koichi Kinoshita, both of Saitama, Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, Japan

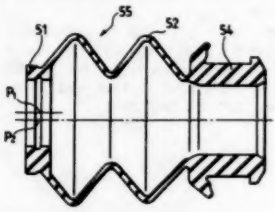
Filed Jan. 21, 1992, Ser. No. 822,898
Claims priority, application Japan, Jan. 24, 1991, 3-022596
Int. Cl.[5] F16D *65/00*
U.S. Cl. 188—73.44 **5 Claims**

1. A pin boot for a disc brake having a caliper supporting member for supporting a disc brake body member, the supporting member having a slide hole provided on one of said members and a pin fittable into the other of said members, comprising:

a flange mounted to a boss portion in an opening formed in the slide hole;

a flexible bellows portion extending from said flange; and

a seal portion adjoining the bellows portion and engageable with said pin,



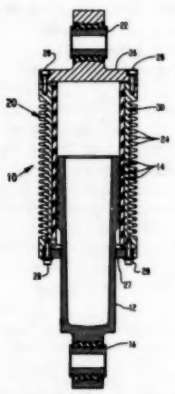
wherein the rigidity of at least one of said bellows portion, said seal portion and a connecting portion for connecting said bellows and seal portion with each other is non-uniform in the circumferential direction thereof.

5,183,137

DUAL-RATE SURFACE EFFECT DAMPERS

C. Kenneth Siwek, Erie; Wallace C. Flower, McKean, and Gene D. Garn, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Dec. 20, 1991, Ser. No. 811,758
Int. Cl.[5] F16F *7/08*
U.S. Cl. 188—381 **17 Claims**



1. A dual-rate surface effect damper producing a damping force having a hysteretic component and a friction component, said damper comprising:

a) a housing;

b) a rubbing member mounted for relative movement with respect to said housing;

c) a first elastomeric liner section having a first length with a first substantially uniform inner diameter for engagement by said rubbing member to produce a first surface effect damping force;

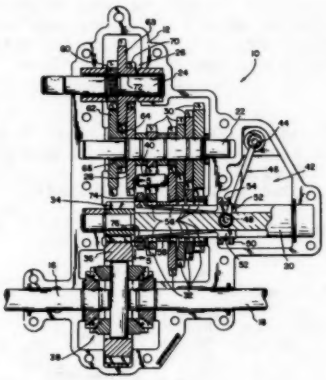
d) a second elastomeric liner section having a second length with a second smaller substantially uniform inner diameter for engagement by said rubbing member to produce a second larger surface effect damping force.

5,183,138

TRANSMISSION PARKING BRAKE

Norman E. Jolliff, Onsted, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 23, 1992, Ser. No. 824,379
Int. Cl.[5] B60K *41/26*
U.S. Cl. 192—4 C **20 Claims**



1. A transmission comprising:

a housing consisting essentially of a first material;

a plurality of shafts rotatably disposed within said housing, one of said shafts being a shift shaft with a plurality of gears thereon, said shift shaft including an axial channel and each of said gears having a keyway;

a key disposed within said axial channel of said shift shaft, said key including means for engaging one of said gear keyways;

shifting means for moving said key within said shift shaft and selectively engaging said key with one of said keyways; and

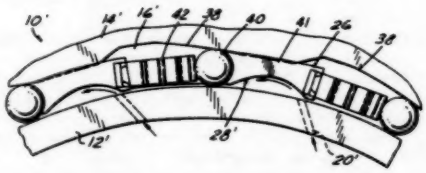
a parking block consisting essentially of a second material having greater strength than said first material, said parking block including means for engaging said key whereby said key is locked to said parking block to thereby prevent rotation of said shift shaft.

5,183,139

OVERRUNNING CLUTCH HAVING A CAGE DESIGN FOR DIRECTING LUBE FLOW

Gregory J. Malecha, Naperville, Ill., assignor to Borg-Warner Automotive Transmission & Engine Components Corporations, Sterling Heights

Filed Jan. 9, 1992, Ser. No. 819,153
Int. Cl.[5] F16D *41/06*
U.S. Cl. 192—45 **9 Claims**



9. An overrunning clutch (**10**) comprising:

an inner race (**12**) having a central axis of rotation;

an outer race (**14**) disposed around the inner race (**12**), the inner and outer races defining an annular space (**16**) therebetween;

unidirectional drive mans for fixing the outer race against rotation relative to the inner race, the unidirectional drive means including clutch elements engaging the inner race along a contact surface;

means for supplying lubrication from the inner race (12) to the annular space (16) between the inner and outer races; and

a cage (22) disposed in the annular space (16) between the inner and outer races and retaining the unidirectional drive means, the cage (22) including a plurality of interconnecting elements (24,41) each having an inner side (28) facing the inner race (12) and an outer side (26) facing the outer race (14), at least one of the interconnecting elements (24,41) also having an arcuate lubrication flow surface located between adjacent clutch elements, the lubrication flow surface being adapted to redirect at least a portion of the lubrication supplied from the inner race toward the contact surface.

5,183,140

TORQUE LIMITING MECHANISM FOR USE IN A DRIVE SYSTEM

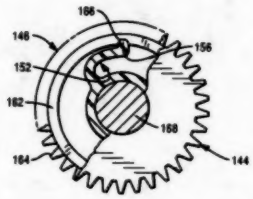
Kenneth A. Nicoll, Dundee, Scotland, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 697,352, May 6, 1991. This application Feb. 24, 1992, Ser. No. 841,245

Claims priority, application United Kingdom, Nov. 16, 1990, 9024988

Int. Cl.[5] F16D *43/20*

U.S. Cl. 192—56 R **8 Claims**



1. A torque limiting mechanism for use in a drive system, comprising:

first and second rotatable members, one of which serves as a driving member and rotates in a given direction of rotation and the other of which serves as a driven member, said first and second rotatable members having a common axis of rotation, said first rotatable member being positioned within said second rotatable member;

said first rotatable member including an annular cylindrical hub portion having an internal circular bore, and a single integral resilient finger, having substantially the same width as said cylindrical hub portion, projecting from an outer surface of said cylindrical hub portion, said integral resilient finger including a first radially projecting portion adjacent to the cylindrical hub portion, an integral central portion arcuately concentric with and spaced from said cylindrical hub portion and connected at one end to said first radially projecting portion and an engaging end portion connected to the other end of said integral central portion;

said second rotatable member including a hollow cylindrical portion of approximately the same width as said cylindrical hub portion for receiving said cylindrical hub portion of said first rotatable member, said hollow cylindrical portion including a single recess for receiving the engaging end portion of the integral resilient finger of said first rotatable member; said engaging end portion engaging resiliently in said recess to cause a driving torque to be applied to said driven member, said integral resilient finger disengaging from said recess when said driving torque exceeds a certain limit so as to enable said driving member to rotate relative to said driven member, said recess and said engaging end portion of said integral resilient finger each extending substantially for the width of the hollow cylindrical portion of the second rotatable member in a direction parallel to said axis of rotation.

5,183,141

RELEASE MECHANISM FOR PULL-TYPE CLUTCH

Minoru Abe, and Tetsuji Takano, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

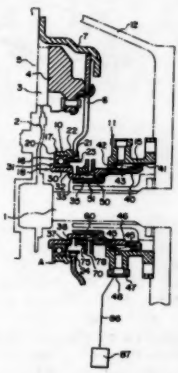
PCT No. PCT/JP91/00619, § 371 Date Jan. 22, 1992, § 102(e) Date Jan. 22, 1992, PCT Pub. No. WO91/18222, PCT Pub. Date Nov. 28, 1991

PCT Filed May 9, 1991, Ser. No. 807,830

Claims priority, application Japan, May 24, 1990, 2-134756

Int. Cl.[5] F16D *23/14, 25/08*

U.S. Cl. 192—91 A **4 Claims**



1. In a pull-type clutch disengaged by pulling an inner peripheral part of a diaphragm spring to an axial backside of the clutch; a release mechanism for said pull-type clutch having a release bearing assembly connected to an inner peripheral part of said diaphragm spring, a cylinder assembly mounted to a housing of said clutch at an axial backside of said release bearing assembly, plural first claws, extending backward in an axial direction of said clutch and formed on said release bearing assembly, plural second claws extending forward in an axial direction of said clutch and integrally formed on a piston of said cylinder assembly, said first and second claws being disposed with clearance left between said first claws and said second claws, respectively, in a circumferential direction, said piston being axially movable relative to said release bearing assembly from a first position where said first claws are axially spaced apart from said second claws to a second position where said second claws are positioned circumferentially between said first claws, a connecting ring extending in said circumferential direction and expandable in radial directions positioned on outer peripheries of said second claws and immovable in said axial direction of said clutch relative to said second claws, connecting grooves on an outer periphery of said first claws into which said connecting ring fits when said piston is in said second position, guide portions formed on rear outer peripheries of said first claws, said guide portions being engageable with an inner periphery of said connecting ring to expand said ring when said piston moves from said first position to said second position, a ring stopper movable between a front releasing position and a rear engaging position, together wtih a stopper spring on said release bearing assembly for urging said stopper backward, said ring stopper, fitting onto an outer periphery of said connecting ring, when said piston is in

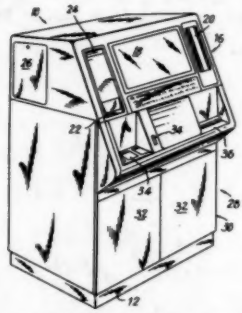
said second position and said ring stopper is at said engaging position, and tool supports facing each other, with an axial tool insertion clearance therebetween on said ring stopper and said cylinder assembly.

5,183,142

AUTOMATED CASHIER SYSTEM

Gerard Latchinian; Ramy Latchinian, both of Rockville, Md., and Franklin Camper, Hueytown, Ala., assignors to Ramy Systems, Inc., West Palm Beach, Fla.

Filed Oct. 18, 1990, Ser. No. 599,667
Int. Cl.[5] G07F *7/04, 7/08*
U.S. Cl. 194—206 **9 Claims**



1. An automated cashier apparatus, comprising a console having first and second compartments therein, said first and second compartments being separately and independently accessible; data entry means for accepting purchase information rom a customer and data display means for displaying sale-related data to the customer; communication means for transmitting said purchase information to a remote order fulfillment means, said data entry and display means and communication means being mounted in said first compartment; means for accepting credit card purchase information; coin and currency acceptance, storage and dispensation means located in said second compartment, said second compartment comprising a tamper-resistant safe structure; said data entry and display means, credit card acceptance means and coin and currency acceptance and dispensation means being logically interconnected and controlled by microprocessor means comprising a primary microprocessor located in said second compartment and a secondary microprocessor located in said first compartment, said primary microprocessor adapted to control coin and currency acceptance and dispensation and said secondary microprocessor adapted to perform order acceptance and display functions.

5,183,143

APPARATUS AND METHODS FOR CONVEYING MATERIALS

James F. Sullivan, Jr., Garland, Tex., assignor to Triple/S Dynamics, Inc., Dallas, Tex.

Filed May 31, 1991, Ser. No. 708,288
Int. Cl.[5] B65G *37/00*
U.S. Cl. 198—370 **21 Claims**

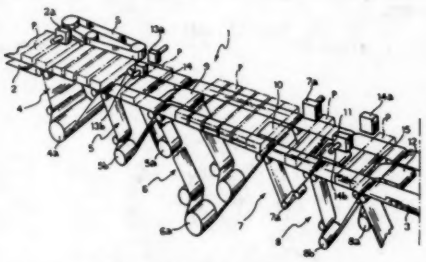
1. A vibrating conveyor for selectively delivering material from a source of material to a material discharge location comprising means for receiving said material, continuously vibrating member, and means for selectively coupling and uncoupling said material receiving means to said continuously vibrating member so that said means for receiving said material vibrates and said conveyor delivers said material to said material discharge location when said material receiving means is coupled to said continuously vibrating member, and said means for receiving said material is motionless when uncoupled from said continuously vibrating member and said conveyor stops delivery of said material to said discharge location when said means for receiving said material is uncoupled.

5,183,144

APPARATUS FOR ORIENTING PRODUCTS ON A CONVEYOR LINE PARTICULARLY FOR AUTOMATIC PACKAGING MACHINES AND METHOD RELATING THERETO

Renzo Francioni, Prato Sesia, Italy, assignor to Cavanna S.p.A., Italy

Continuation of Ser. No. 567,891, Aug. 15, 1990, abandoned.
This application Feb. 10, 1992, Ser. No. 832,885
Claims priority, application Italy, Aug. 16, 1989, 67706 A/89
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—382 **23 Claims**



1. An apparatus for transporting products in a direction of transportation and for orienting them with a principal axis arranged perpendicular to the direction of transportation, comprising:

at least two conveyor formations for products operative in the direction of transportation,

separate drive means for said two conveyor formations which can impart different speeds of movement to said two conveyor formations;

sensor means for detecting the orientation of each said product and for generating at least one signal indicative of a displacement of the principal axis of each said product a displacement of the principal axis of each said product from the orientation in which the principal axis of the product is perpendicular to the direction of transportation,

wherein said sensor means comprise a pair of sensors aligned traverse to the direction of transportation, whereby the time interval between the instants at which the products pass in correspondence with the pair of sensors is indicative of the displacement, and

control means operatively sensitive to the at least one signal generated by said sensor means for controlling the drive means to vary the speed of movement of the conveyor formations in order to annul the displacement, wherein said control means include apparatus configured to be activated when the products pass in correspondence with that one of the sensors which is encountered first by the products, and the signal of the apparatus is used as a signal indicative of the displacement at least until the products pass in correspondence with the other of the sensors, which is the second to be encountered by the products

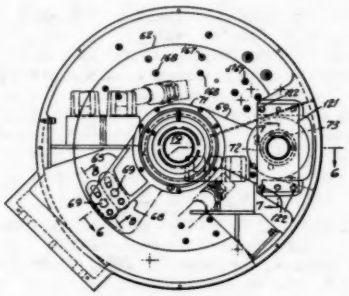
such that corrective action to reduce the displacement is taken immediately upon detection of a direction of the displacement and is completed upon a determination of the amount of the displacement.

5,183,145

APPARATUS AND METHOD FOR AUTOMATICALLY POSITIONING VALVE MEANS CONTROLLING THE APPLICATION OF PRESSURIZED AIR TO MANDRELS ON A ROTATING CARRIER

Robert Williams, Randolph; Enn Sirvet, Washington Township, Bergen County, and Richard A. Gabel, Livingston, all of N.J., assignors to Sequa Corporation, New York, N.Y.

Filed Oct. 11, 1991, Ser. No. 775,206
Int. Cl.[5] B65G *47/26*; B41F *17/22*
U.S. Cl. 198—441 9 Claims



1. A method for loading cylindrical containers onto pins from mandrels on a continuously rotating mandrel carrier that moves said containers in a single file at a substantially faster linear speed than said pins are moving, with each of said containers having a closed end and an open end, said pins being carried by a continuously moving chain and being arranged in first and second rows of pins; said method including the steps of:

delivering said containers from said mandrels to holding elements on a continuously rotating transfer carrier with said closed ends operatively engaging said holding elements by moving said mandrels in single file through a pickup region, moving said holding elements in single file through said pickup region at a linear speed substantially slower than the linear speed of said mandrels, and in said pickup region arranging spacing between adjacent ones of said elements to be substantially less than spacing between adjacent ones of said mandrels;

driving containers from the mandrels to said holding elements by timed application of pressurized air through the mandrels to the interior sides of said closed ends of said containers, with pressurized air being introduced to each of said mandrels at its end remote from the closed end of the container mounted thereon; and

as a function of mandrel speed, automatically controlling operation of valve means through which pressurized air is introduced to each of said mandrels, with the position where pressurized air is introduced to each of said mandrels by said valve means being at a more upstream position as mandrel carrier speed increases;

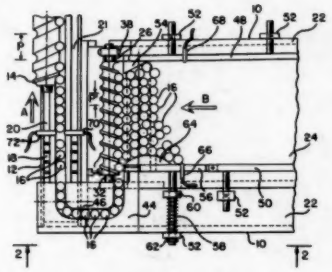
then delivering said containers form said holding elements to said pins by moving said containers through a transfer region located downstream of said pickup region, said containers being entered through their said open ends by said pins and thereby being received by said pins as the latter move through said transfer region.

5,183,146

VIAL OR AMPOULE INFEED CONVEYOR MECHANISM

Urs Reuteler, Lebanon, N.H., assignor to New Jersey Machine Inc., Lebanon, N.H.

Filed Feb. 18, 1992, Ser. No. 838,135
Int. Cl.[5] B65G *47/12*
U.S. Cl. 198—444 12 Claims



1. For delivering vials to be labeled to an infeed conveyor of a labeling machine and thence to a timing screw of the labeling machine, an infeed mechanism comprising a vial separating screw having a vial exit end, a vial infeed belt for supporting and moving vials along a relatively wide path toward said vial separating screw and placing vials in engagement with said vial separating screw, a pair of spaced vial guides defining a relatively narrow vial path therebetween, and means for rotating said vial separating screw to deliver vials single file into said relatively narrow path between said vial guides and thence onto the infeed conveyor of the labeling machine and on into engagement with the timing screw of the labeling machine.

5,183,147

CHEMICAL HANDLING SYSTEM

David D. Callahan, Rochester; Craig Reese, Roanoke; Douglas P. Baxter, Rochester, and Stephen M. Murray, Fort Wayne, all of Ind., assignors to Murray Equipment, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 654,785, Feb. 11, 1991, abandoned. This application Nov. 12, 1991, Ser. No. 790,371
Int. Cl.[5] B65G *33/26*
U.S. Cl. 198—524 29 Claims

1. A chemical conveying system for conveying dry chemical to a chemical distribution apparatus comprising:

a tank;

an integral, internal auger mechanism disposed within said tank, said auger including a drive end and a separate, opposite outlet end;

a motor detachably mounted to said tank, said motor including a drive shaft adapted to detachably drivingly engage said drive end of said internal auger mechanism; and

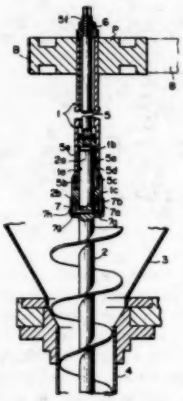
a flexible auger delivery tube having a flexible auger therein, said flexible auger including on one end thereof engaging means for detachable rotational engagement with the said outlet end of said internal auger mechanism.

5,183,148

SCREW FEEDER

Fumio Kondo, Chiba, Japan, assignor to Tokyo Automatic Machinery Works, Ltd., Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,227
Claims priority, application Japan, Sep. 17, 1990, 2-248001
Int. Cl.[5] B65G *33/34*
U.S. Cl. 198—674 **16 Claims**



1. A screw feeder having an outer pipe and a hopper, the outer pipe being positioned vertically below a lower end of said hopper, said outer pipe including a screw shaft adapted to transport a substance in said hopper in response to rotation of a driving shaft which is connected to said screw shaft, said driving shaft comprising a tube, with a connecting rod being positioned on the inside of said tube, said connecting rod being adapted to reciprocate along the axial direction of said driving shaft, said driving shaft further comprising a recessed portion into which a base end of said screw shaft is positioned, and slit portions which comprise means for dividing a circumferential wall of said recessed portion in a generally circumferential direction, said slit portions being formed in a generally axial direction at one end of said connecting rod, a frustoconical face portion being provided along an outer circumferential surface of said circumferential wall of said recessed portion, wherein the diameter of said frustoconical portion gradually increases in a direction towards said screw shaft, a tapered portion being formed, in opposed relationship to said frustoconical portion, along an inner circumferential face of said tube, said tapered portion being adapted to engage said frustoconical portion of said connecting rod in an axial direction.

5,183,149

BELT CONVEYOR SYSTEM

Michael J. Wierman, Helsingborg, and Lennart F. Olsson, Nyhamnsläge, both of Sweden, assignors to Frigoscandia Food Process Systems AB, Helsingborg, Sweden

Filed Sep. 11, 1991, Ser. No. 757,793
Int. Cl.[5] B65G *13/02*
U.S. Cl. 198—778 **9 Claims**

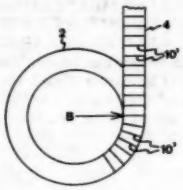
1. In a plant for treatment of food products, a belt conveyor system comprising

an endless conveyor belt following, through part of its length, a helical path section preceded by a first straight path section, and followed by a second straight path section,

said belt comprising transverse elements interconnected by links disposed along opposite lateral edges of the belt,

the successive links at each lateral edge of the belt being mutually slideable in the longitudinal direction of the belt and mutually pivotable about a transverse axis substantially in the plane of the belt, such that the belt is permitted to follow lateral curves in both directions and to pass around a roller having an axis parallel to said transverse axis;

and further comprising means for collapsing the belt along a predetermined part of said first straight path section closest to said helical path section, the links at a point of a transition from said first straight path section to said helical path section being expanded along the outer lateral



edge of the belt and being held collapsed along the inner lateral edge of the belt, and

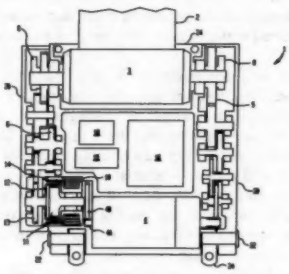
traction means for applying a tractive force on the links at both lateral edges of the belt in said second straight path section, the links at the point of transition from said helical path section to said second straight path section being expanded along the inner lateral edge of the belt and being held expanded along the outer lateral edge of the belt.

5,183,150

CARGO DRIVE UNIT WITH A HYSTERESIS COUPLING

Henry H. Chary, Rancho Palos Verdes; Thomas F. Fitgibbon, Long Beach, and Christopher M. Gibson, Fountain Valley, all of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 13, 1991, Ser. No. 806,686
Int. Cl.[5] B65G *13/02*
U.S. Cl. 198—782 **21 Claims**



1. A cargo drive unit of the type which is part of an array of several such units for driving a load from one transportable location to another, said cargo drive unit comprising:

an electric motor having an output shaft;

load driving means for first contacting and then driving a load;

coupling means disposed between the motor and the load driving means and including input means coupled to the motor shaft, output means coupled to the load driving means and current responsive means arranged with the input and output means;

means for applying current to the current responsive means, whereupon a force is developed between the input and the output means which is proportional to said current applied to said current responsive means, said force affecting the driving of the load driving means by the motor; and

means for adjusting the current applied to the current re-

sponsive means for adjusting the force of the load driving means against a load.

5,183,151

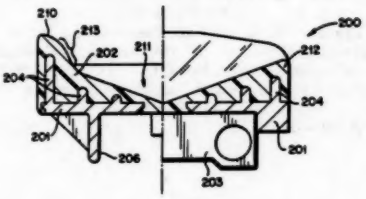
HANDLING OF FRUIT USING DUAL PLASTIC CUP CONSTRUCTION

Harry C. Powell, Jr., Faber, Va., assignor to Powell Machinery, Inc., Faber, Va.

Division of Ser. No. 374,827, Jul. 3, 1989, Pat. No. 5,086,909, which is a continuation-in-part of Ser. No. 248,199, Sep. 23, 1988, Pat. No. 4,957,619. This application Feb. 21, 1991, Ser. No. 658,672

Int. Cl.[5] B65G *37/00*

U.S. Cl. 198—803.01 **14 Claims**



1. A cup connectable to a transporting chain for holding a discrete bruisable element, comprising:

a first body of a first plastic material which has dimensional stability, including means for connecting said body to a transporting chain; and

a second body of a second plastic material which is of less expensive material and of less dimensional stability than said first material, said second body irremovably connected to said first body and extending therefrom in a dimension opposite said connecting means, and having an exterior contour for holding a discrete bruisable element therein so that it will not inadvertently move out of said body;

said second body having a generally conical depression contour between front and rear, and two side, edges, said front and rear edges being longer than said side edges; and

wherein said depression has a greater effective angle of inclination at at least a portion thereof from the bottom thereof to said front and rear edges than from the bottom thereof to said side edges.

5,183,152

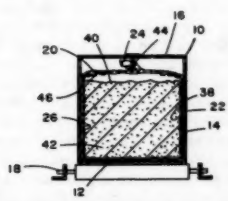
HUMECTANTS IN JOINT COMPOUND CONTAINERS

James L. Zak, Cheektowaga, and Richard E. Smith, Williamsville, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Sep. 4, 1990, Ser. No. 576,912

Int. Cl.[5] B65D *85/84*

U.S. Cl. 206—524.4 **7 Claims**



1. A container comprising watertight walls forming a complete enclosed watertight container and a thin layer of a humectant disposed on substantially all of the inner surfaces of said container as are likely to contact any aqueous slurry contents placed in said container, wherein said watertight walls are a plastic film.

5,183,153

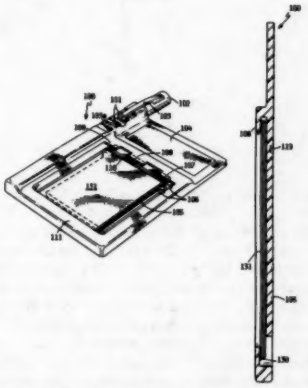
PAD HOLDER

Richard A. Linn, 4237 Thomas Ave. N., Minneapolis, Minn. 55142

Continuation-in-part of Ser. No. 571,993, Aug. 24, 1990, Pat. No. 5,060,794. This application Aug. 19, 1991, Ser. No. 747,724

Int. Cl.[5] A45C *11/32*

U.S. Cl. 206—232 **5 Claims**



1. A device to be carried about in a users pocket or purse with the device operable for holding a stack of individual sheets of paper without bending the papers comprising:

a one piece frame;

a panel, said panel integrally and cantileverly connected to said frame, said panel having a region for fastening a stack of individual sheets of paper to said panel, said panel and said frame co-acting to form a protective recess for protectively receiving and storing the stack of individual sheets of paper; and

a first lip mounted on said frame and extending at least partially over said region for fastening the stack of individual sheets of paper, said first lip extend over a first end of the stack of individual sheets of paper;

a second lip mounted on said frame, said second lip spaced from said panel, said second lip projecting inward into said protective recess said second lip extending over a second end of the stack of individual sheets of paper to sandwichingly hold said second end of the stack of individual sheets of paper between said resilient panel and said second lip, said second lip coacting with said panel to form means for holding a free end of the stack of individual sheets of paper between said second lip and said panel, said second lip and said panel spaced sufficiently far from each other to permit a user to flex said panel to thereby remove an individual sheet of paper from the stack of individual sheets of paper by forcing the free end of an individual sheet of paper out of said protective recess so that a user can remove the individual sheet of paper to thereby expose an unused sheet paper.

5,183,154

GOLF BALL HOLDER DISPENSER

Mark C. Slemp, R.R. 1, Box 125, Alton, Iowa 51003

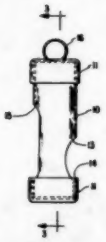
Filed Jan. 24, 1992, Ser. No. 825,595

Int. Cl.[5] B65D *85/58*

U.S. Cl. 206—315.9 **3 Claims**

1. A ball holder comprising tubular holding means including

a wall forming a tube having an approximately circular cross section; closure means at both ends of said holding means to confine balls within said tubular means; said tubular means being formed with an elliptical opening having a minor axis when said wall is flat substantially equal to the diameter of the ball being held; said minor axis, when said wall is curved to form said tube, being slightly smaller than the diameter of said balls; said wall being deformable enough to allow said opening to expand in the direction of said minor axis to allow said ball to be pushed through said opening.



2. A ball holder comprising tubular holding means, caps at both ends of said holding means to confine balls within the holding means, said caps being fixed to said tubular means to hold and support said tubular means in tubular configuration, said tubular means being formed with a substantially elliptical opening near one end of said tubular means, the cap at said one end having a rim extending so as to cover a minor portion of said opening, said opening having a minor axis slightly smaller than the diameter of the balls being held, said tubular means having walls deformable enough to allow said opening to expand in the direction of said minor axis to allow said ball to be pushed through said opening.

5,183,155

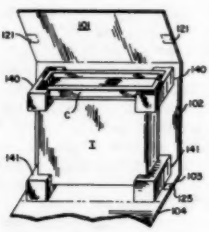
PACKAGING SYSTEM FOR A TOILET WATER TANK AND COVER

Paul P. Vavra, 519 Pine Tree Rd., Kohler, Wis. 53044

Filed Dec. 20, 1990, Ser. No. 630,526

Int. Cl.[5] B65D *85/00*

U.S. Cl. 206—320 **3 Claims**



1. An open-ended shipping container for an article and a cover for the article, comprising:

separating means placed between the article and the cover and extending across and beyond the outer edges of the article and the cover for spacing and supporting the article cover above the top of the article;

a top panel placed on top of the article cover and extending across and beyond the outer edges of the article cover;

a bottom panel placed below the article and extending across and beyond the outer edges of the article;

wherein the top and bottom panels and the separating means cooperate to define an open-ended container structure in which the ends of the article are exposed;

a pair of spaced lower supporting pads disposed between the article and the bottom panel which engage the bottom of the article at spaced locations to define a space between the bottom of the article and the bottom panel;

securing means for securing the article, article cover, the panels, the separating means and the supporting pads together to form an open-ended container for the article and article cover, comprising a strap wrapped about the article, article cover and panels; and

flaps formed from portions of the top panel and the bottom panel, the flaps defining cut-out areas within which the strap is received, and wherein the flaps engage the separating means and the lower supporting pads.

5,183,156

NEEDLE REMOVAL/CONTAINMENT AND TRANSPORT APPARATUS FOR SAFE STORAGE AND DISPOSAL OF HYPODERMIC NEEDLES/SYRINGE ASSEMBLIES

John Bruno, 77-83 Second Ave., Paterson, N.J. 07514

Continuation of Ser. No. 627,314, Dec. 14, 1990, abandoned, which is a division of Ser. No. 423,977, Oct. 19, 1989, Pat. No. 5,031,767. This application Jun. 15, 1992, Ser. No. 899,103

Int. Cl.[5] B65D *85/10*

U.S. Cl. 206—366 **11 Claims**

1. A needle removal and storage device adapted to disengage hypodermic needles attached to a syringe body via a needle a hub member, and to be connected to a storage container providing entry means to collect and store the used needle implements for disposal, comprising:

a base plate member connectable to said container and providing a receiving slot formed thereinto;

a needle engaging member formed along a second plate attached to said base plate member, said second plate angled towards the interior of said container, wherein said needle engaging member comprises a pair of opposed finger members integrated with said second plate to define a engaging slot disposed generally opposite said receiving slot in lateral alignment therewith, the entrance into said engaging slot being at a generally lower elevation than that of said receiver slot;

said needle hub member slidably translatable into engagement with said finger members such that said syringe body may be attached from said hub member, wherein said detached needle and syringe is translatable out of said engaging slot back towards said receiving slot such that said hub member is disposed below said base plate member, permitting said needle to drop into said container through said entry means, said hub member engagable with the underside of said base plate member in response to upward pulling forces applied to said syringe body to ensure complete detachment of said need and syringe body.

8. A needle removal and storage device formed from an injection-molded thermoplastic material adapted to disengage hypodermic needles attached to a syringe body via a needle

hub member, and to be connected to a storage container providing entry means to collect and store the used needle implements for disposal, comprising:

a base plate member connectable to said container and providing generally U-shaped first receiving slot means;

a needle engaging member formed in a second plate integral with said base plate member and recessed towards the interior of said container, said needle engaging member comprising a pair of opposed finger members integrated with said second plate to define second slot means disposed generally opposite said first receiving slot means in lateral alignment therewith, the entrance than that of said first slot means, said second slot means providing a generally rectangular receiving slot portion adjacent said first slot means and a contiguous generally U-shaped engaging slot portion;

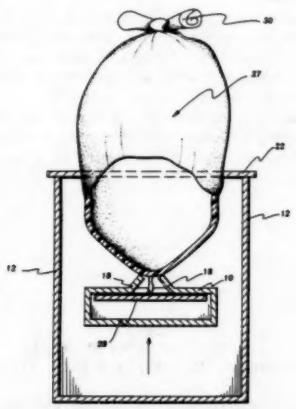
said needle hub member slidably translatable through and receiving slot portion into engagement with said finger members such that said syringe body may be detached from said hub member, said detached needle and syringe translatable out of said engaging slot portion, through said receiving slot portion, thence into said first receiving slot means such that said hub member is disposed below said base plate member permitting said needle to drop into said container through said first entry means, said hub member engagable with the underside of said base plate member in response to upward pulling forces applied to said syringe body to ensure complete detachment of said needle and syringe body.

5,183,157

PLASTIC BAG DISPENSING SYSTEM

Louis R. Darden, 8410 Gaylord Rd., Richmond, Va. 23229

Filed Oct. 1, 1991, Ser. No. 769,381
Int. Cl.[5] B65D *25/16*
U.S. Cl. 206—390 **4 Claims**



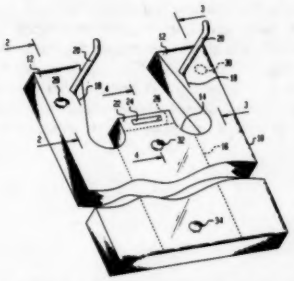
1. Bag dispensing apparatus comprising a container having a restricted opening, a series of bags positioned in the container and sequentially removable through said opening, said bags being connected in sequence and folded into a stack, a line of weakness between each pair of adjacent bags to permit separating them by tearing across the line of weakness, and means to prevent the last bag of the sequence from being detached from said container.

5,183,158

BAG DISPENSING SYSTEM AND BAG PACK

Dana M. Boyd, Rushville; William J. Randolph Jr., Marion, both of N.Y.

Continuation of Ser. No. 713,223, Jun. 11, 1991, abandoned.
This application Jul. 17, 1992, Ser. No. 914,657
Int. Cl.[5] B65D *27/10*
U.S. Cl. 206—554 **12 Claims**



1. A pack of thermoplastic film bags, said bags being in at least approximately registration, each bag comprising a bottom, front and rear walls connected by way of gusseted side walls, a bag mouth, double film loop handles at opposite ends of the bag mouth, said handles being integral extensions of said walls;

said pack having pack suspension means in association with said handles about intermediate between the top and the base of said handles; and

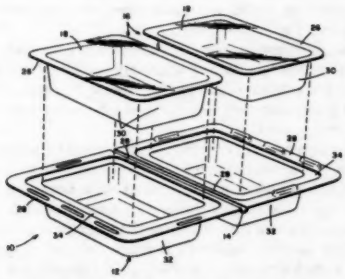
first releasable means between the upper rear portion of a lead bag and the upper front portion of the next bag, said upper portion including the portion from just below the bag mouth to the extent of the handles, which, upon removal of said lead bag from the pack, causes an initial opening of the top portion of said next bag and second releasable means located between each rear and front wall at the lower portion of each bag near the bottom of each bag to cause a more complete opening of said next bag on removal of said lead bag by the handles thereof.

5,183,159

SUSPENSION CUSHIONING PACKAGE

Robert J. Hojnacki, Guilford, Conn.; Daniel C. Pearson, Warminster, Pa.; Gerard K. Brucker, Horsham, Pa.; Michael J. Gober, Warrington, Pa., and Daniel J. Shaw, Jr., Haverhill, Mass., assignors to United Foam Plastics, Georgetown, Mass.

Filed Jul. 26, 1991, Ser. No. 736,226
Int. Cl.[5] B65D *85/30*
U.S. Cl. 206—583 **13 Claims**



1. A suspension cushioning package comprising:

a. a pair of package frame members, each of which defines a planar face and a well extending therebelow, each said

planar face further defining a depressed area around the perimeter of its respective well;

b. a hinge connecting the frame members to permit articulation between an open position and a closed position wherein said members are disposed face-to-face;

c. means for locking the frame members in said closed position; and

d. an insert tray disposed in the well of each frame member, each said insert tray comprising;

(i) side walls dimensioned to interfit with its respective well, said side walls including flanged portions for interfitting with the respective depressed area; and

(ii) a stretchable resilient film sealed to the flanged portions and spanning the distance between the flanged portions, and disposed substantially in parallel with the planar face of its respective frame member.

5,183,160

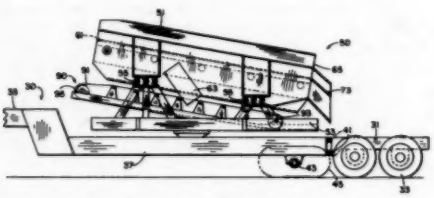
HIGH VOLUME PADDING MACHINE

Ray McClain, 20152 E. 2nd, Tulsa, Okla. 74108

Filed Oct. 24, 1990, Ser. No. 605,225

Int. Cl.[5] B07B *9/00*

U.S. Cl. 209—234 **4 Claims**



1. A padding machine to be towed behind a motorized carrier comprising:

transport means adapted to be hitched to said carrier;

seat means disposed on said transport means;

bearing means nestled in said seat means;

support means mounted on said bearing means above said transport means;

hopper means mounted on said support means having a bottom with a first discharge port therein;

separator means for catching relatively large stones and debris in earth fed into said hopper means and for passing separated materials therethrough;

sift means mounted in said hopper means beneath said separator means for catching relatively medium size stones and debris passing through said separator means and for passing sifted materials through said sift means and said first discharge port;

discharge means for distributing stones and debris caught by said sift means outwardly of said hopper means;

collection means mounted beneath said hopper means for receiving said sifted materials passing through said sift means and said first discharge port and for conveying said sifted materials outwardly in relation to said hopper means to a discharge end of said collection means; and

delivery means for conveying said sifted materials from said discharge end of said collection means to a discharge end of said delivery means.

5,183,161

PROCESS AND APPARATUS FOR SEPARATING GRAIN MIXTURE

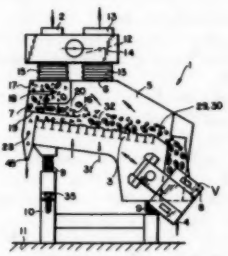
Roman Mueller, Niederuzwil, Switzerland, assignor to Buehler AG, Uzwil, Switzerland

Continuation of Ser. No. 391,554, filed as PCT/EP88/01078, Jul. 21, 1989, published as WO 89/04721, Jun. 1, 1989, abandoned.

Claims priority, application Switzerland, Nov. 27, 1987, 04626/87; Mar. 24, 1988, 01110/88

Int. Cl.[5] B03B *4/00*

U.S. Cl. 209—467 **8 Claims**



1. Apparatus for separating heavier materials from a product stream of lighter grain materials, the apparatus comprising:

an inclined table permeable to air having a higher and lower end;

oscillating means for oscillating said inclined table so that the heavier material moves in a direction toward the higher end of said table;

distributing means being positioned above the higher end of said table and having a cascade of trays and a guide plate for guiding the product stream to the higher end of said table; and

air flow means for supplying air flow through said table in an upward direction to move the lighter material in the direction of the lower end of said table, the higher end of the table defining a separation zone with said distributing means for taking out the heavier materials from the product stream;

said air flow means supplying air flow through the totality of the table in an upward direction to create said separation zone; said guide plate being arranged over the full width of said table and being arranged to oscillate with said cascade of trays and said inclined table;

the upwardly directed air flow being guided between said distributing means and the table, toward the lower end of the table, to create a flow return zone for the lighter material.

5,183,162

MOBILE MOUNT SYSTEM

Robert Ritzenthaler, 1181 Kempton Park, McKinney, Tex. 75069

Filed May 10, 1991, Ser. No. 698,712

Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—1.57 **10 Claims**

1. A. mobile mount system comprising:

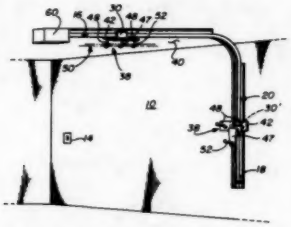
an elongated track attached to a wall;

an endless weight carrying band associated with the track;

a mount detachably coupled to the band for receiving an object, the mount being movably coupled to the track; and

power means engaging the band for enabling selective

movement of an object placed on the mount to a position where the mount can be detached from the band and the



object left in the position where it will not interfere with other objects when not in use.

5,183,163

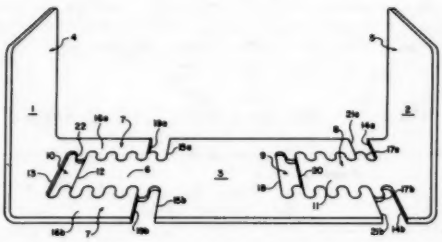
INTERLOCKING-CONTINUOUS BASE BOOKENDS

Stephen J. Slaiken, 9906 Woodlake Cove, Austin, Tex. 78733

Filed Jan. 30, 1992, Ser. No. 828,354

Int. Cl.[5] A47F *5/00*

U.S. Cl. 211—43 **2 Claims**



1. An interlocking continuous base bookend device comprising:

a) a first and second upright end unit each having a longitudinal base leg of uniform thickness so that when joined they form a level base;

b) said first upright end unit longitudinal base leg having a female cut-out opening surrounded on three sides by oppositely positioned base fingers and a base opening stop between said fingers at said first upright end unit;

c) said second upright end unit longitudinal base leg having a male base-tongue;

d) said first upright female longitudinal base leg cut-out opening fashioned to receive said longitudinal leg male base-tongue so that a continuous base is formed; and

e) interlocking means for releasably coupling and readjusting the width of said continuous base comprising shapes formed along the outside edges of said longitudinal leg male base-tongue conformed to releasably correspond with shapes formed along the adjacent inside edges of said female longitudinal base leg cut-out opening so that said upright end units are adjustably joined by meshing said shapes and the width of said device fixed.

5,183,164

CLAMPING HOLDER FOR SUSPENDING SKIS

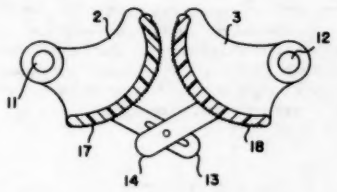
Egon Heinzle, Laterns, Austria, assignor to Snowboardklinik Und Handelsges M.B.H., Innsbruck, Austria

Continuation-in-part of Ser. No. 537,370, Jun. 13, 1990, abandoned. This application Sep. 30, 1991, Ser. No. 769,192

Claims priority, application Austria, Feb. 3, 1989, 226/89

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—70.5 **6 Claims**



1. A holder for suspending skis, comprising support means, two clamping jaws rotatably supported on said support means, said clamping jaws being rotatable about a respective axis of rotation and being supported symmetrically opposite one another relative to a vertical plane, freely cantilevering arms rigidly connected to said clamping jaws in the vicinity of said support means, said cantilevering arms having ends being in mutual rotational engagement for effecting interdependent rotation of said clamping jaws, said clamping jaws having effective surfaces facing toward one another, said effective surfaces being convex with an axis of curvature being oriented substantially perpendicular to said support means and being located at a given distance from said axis of rotation, and a friction layer formed of thermoplastic material covering said effective surfaces.

5,183,165

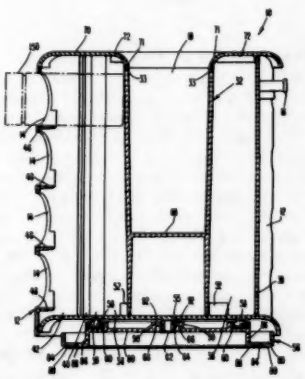
KITCHEN STORAGE UNIT

Bruce Acona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.

Continuation of Ser. No. 605,059, Nov. 2, 1990, abandored. This application Apr. 6, 1992, Ser. No. 864,138

Int. Cl.[5] A47B *73/00*

U.S. Cl. 211—77 **20 Claims**



1. A kitchen storage unit, comprising:

(a) a body having an interior volume;

(b) a plurality of vertical members disposed about a perimeter of said body, each one of said vertical members including one or a plurality of apertures for receiving containers;

(c) a plurality of pegs extending from an upper portion of

said body, wherein no portion of any one of said apertures in said vertical members is directly beneath any one of said pegs; and

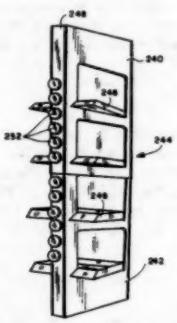
(d) a receptacle formed centrally in said body and having an opening defined by a hole in a top surface of said body, whereby items may be received in said receptacle and protrude above said top surface of said body and having a wall defining an interior space within said interior volume, and said wall having an exterior surface, said exterior surface of said receptacle being inward of said apertures, an unobstructed passage extending between each of said apertures and said exterior surface of said receptacle being selected so that said exterior surface of said receptacle and each of said apertures form a support for a container, said passage having a distance between the aperture and the exterior surface of said receptacle.

5,183,166

FOLDABLE SHELF DISPLAY

Paul Belokin, Jr.; Martin P. Belokin, and Norman P. Belokin, all of 7801 I-35N and Milam Rd., Denton, Tex. 76201

Filed Jan. 7, 1991, Ser. No. 638,082
Int. Cl.[5] A47F *5/08*
U.S. Cl. 211—149 **15 Claims**



1. A collapsible display device comprising:

a wall blank having at least a flat rear wall panel and two converging flat side wall panels foldably connected to the rear wall panel to define a continuous wall structure,

the wall blank being collapsible to a flattened state for storage and transportation and convertible to an expanded display state in which the wall panels cooperatively bound a polygonally shaped inner display space,

first and second substantially flat flaps respectively associated one each with the two converging side wall panels;

means attaching each of the first and second flaps foldably relative to its respective side wall panel so that each of the flaps can be swung inwardly of the display space into a juxtaposed position to afford openings in each of the side wall panels; and

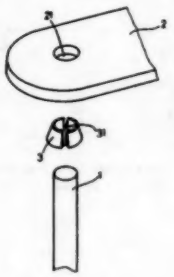
means interconnecting the first and second flaps with the rear panel whereby each of the first and the second flaps has a tab and the rear wall panel has a slot positioned to receive each of said tabs to interconnect the first and second flaps with the rear panels when the flaps are in juxtaposed position so that the juxtaposed flaps define a shelf within the polygonal display space for articles to be displayed.

5,183,167

ADJUSTABLE MULTI-DESK RACK

W. H. Cheng, No. 323, Sec. 2, An Kang Rd., Hsin, Tien, Taipei, Taiwan

Filed Sep. 6, 1991, Ser. No. 755,845
Int. Cl.[5] A47F *5/00*
U.S. Cl. 211—187 **2 Claims**



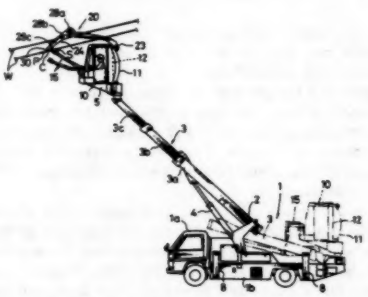
1. A multi-deck rack comprising two supporting posts vertically disposed at two opposite locations and a plurality of boards transversely mounted on said supporting posts, said supporting posts having a substantially continuous outer surface contour devoid of recess openings, each of said boards each having two tapered holes formed at two opposite ends thereof with a split tapered ring fastened in each of said tapered holes for receiving insert of a respective one of said supporting posts, said tapered ring being positionable at a selected infinitely variable vertical position point on said supporting posts, wherein downward pressure applied to each of said boards applies a radial displacement pressure on said tapered rings to firmly secure said tapered rings between said supporting posts and a corresponding board, whereby each of said boards are firmly retained on said supporting posts at said selected location and upward pressure applied to said boards causes said boards to be moved upwards on said supporting posts.

5,183,168

MOBILE VEHICULAR APPARATUS WITH AERIAL CABIN

Mineyuki Fujimoto, Okegawa, Japan, assignor to Aichi Sharyo Co. Ltd., Nagoya, Japan

Filed Sep. 5, 1990, Ser. No. 577,524
Int. Cl.[5] B66C *23/06*
U.S. Cl. 212—232 **8 Claims**



1. An apparatus for moving an operator around a three-dimensional aerial work location, comprising:

a mobile vehicle having a vehicle body, said vehicle body having at least front and rear sides;

a boom upwardly extensibly and downwardly collapsibly mounted on said vehicle body, said boom being mounted

at one end and having a distal end which is opposite said one end;

an operator's cabin mounted on said distal end of said boom, said cabin having a vertical recess defined in a rear side thereof;

at least one manipulator operatively connected to a front side of said cabin; and

a lifter operatively connected to the rear side of said cabin, said lifter being collapsibly storable in said recess and extensible from said recess with a distal end portion of the lifter being positioned in overhanging relation to said cabin.

5,183,169

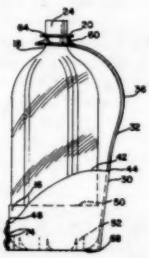
REUSABLE BOTTLE HANDLE

Stephen D. Grzych, S&R Enterprises, P.O. Box 366, Cedar Lake, Ind. 46303

Filed Jun. 14, 1991, Ser. No. 715,497

Int. Cl.[5] B65D *23/10*

U.S. Cl. 215—100 A **19 Claims**



1. A reusable handle in combination with a bottle, the combination including:

a) a bottle having a generally cylindrical body of the type having a neck more narrow than the body of the bottle, and an annular neck flange, the generally cylindrical body having a cylindrical bottom portion;

b) a reusable handle including

1) an upwardly-diverging jacket encircling the bottom portion of the bottle body, a portion of the jacket being in contact with a portion of the bottom portion of the body;

2) a flexible arm extending upwardly from the jacket to a free end, the arm having a gripping portion between the free end and the jacket, the free end having a bottle neck ring defining an opening through which the neck of the bottle extends, the bottle neck ring including a neck locking tab bearing against the bottle neck below the bottle neck flange, the neck locking tab being on the same side of the bottle as the gripping portion of the arm, the bottle neck ring including a surface bearing against the bottle neck opposite the neck locking tab.

5,183,170

FUEL TANK FOR MOTOR VEHICLES

Jürgen Stege, Rohrbach, Fed. Rep. of Germany, assignor to Audi A.G., Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/EP89/00077, § 371 Date Aug. 3, 1990, § 102(e) Date Aug. 3, 1990, PCT Pub. No. WO89/07536, PCT Pub. Date Aug. 24, 1989

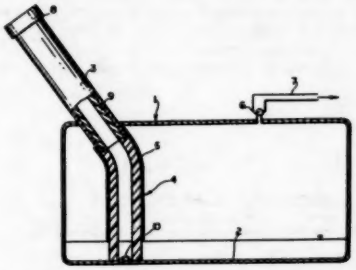
PCT Filed Jan. 31, 1989, Ser. No. 573,023

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804407

Int. Cl.[5] B65D *3/18*

U.S. Cl. 220—86.2 **1 Claim**

1. Fuel tank for motor vehicles, with a filling spout (3) which is adjoined by a component (4) which extends all the way to the tank bottom (2) or terminates near same, characterized in



that the component (4) consists of an open-pore plastic foam material in whose pores the fuel flows to the tank bottom (2).

5,183,171

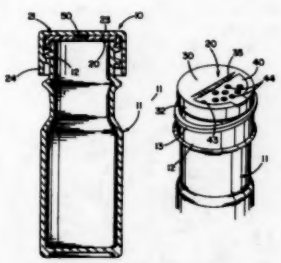
CLOSURE WITH DISPENSING FITMENT AND SCREW-ON CAP

Douglas E. Pherigo, Loves Park, Ill., assignor to J. L. Clark, Inc., Rockford, Ill.

Filed Aug. 23, 1991, Ser. No. 749,122

Int. Cl.[5] B65D *51/18, 47/06*

U.S. Cl. 220—256 **4 Claims**



1. A container closure comprising a cap made of thermoplastic material and having a top wall and an internally threaded skirt integral with and depending from said top wall, a fitment made of thermoplastic material and having a top wall with at least one dispensing opening extending vertically therethrough, said fitment being disposed in said cap with the top wall of the fitment being located in face-to-face relation with the top wall of the cap, and means bonding the top wall of the fitment to the top wall of the cap, said bonding means comprising an ultrasonic weld between the plastic of the top wall of the fitment and the plastic of the top wall of the cap, said weld being sufficiently weak to break and release the cap from the fitment when the cap is twisted relative to the fitment.

5,183,172

DRINK THROUGH CONTAINER LID

Peter K. Boller, Willowdale, Canada, assignor to Lily Cups, Inc., Scarborough, Canada

Filed Mar. 23, 1992, Ser. No. 855,823

Int. Cl.[5] B65D *17/34*

U.S. Cl. 220—270 **8 Claims**

1. A lid of thin thermo-formed plastic material for use as a removable closure cap on an open mouthed beverage cup which has a circular cup rim thereabout, said lid comprising:

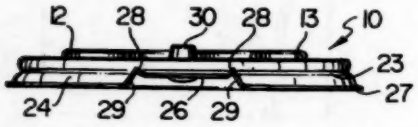
(a) a generally circular main body portion;

(b) at least one predetermined line of weakness formed in a

selected area of said main body portion providing a break-away segment therein;

(c) a circular groove disposed about the periphery of said main body portion, said groove being defined in part by an outer wall that is capable of frictionally engaging an exterior wall of said cup adjacent said rim when said lid is used as a closure cap thereon;

(d) a circular skirt having a skirt bottom and which extends



downwardly from said outer wall and in a direction outwardly from said groove;

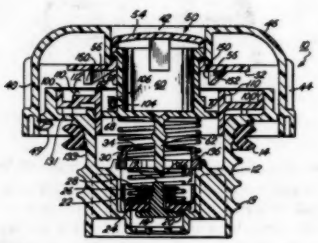
(e) said skirt, along one portion of said skirt bottom adjacent said break-away segment, being provided with a lift tab which extends radially outwardly therefrom and which is further characterized by said lift tab being located at a distance closer to said groove than the distance between said lift tab and the bottom of the remaining portion of said skirt bottom.

5,183,173

AUTO VENTING FUEL CAP

Greg A. Heckman, Dixon, Ill., assignor to Epicor Industries, Inc., Deefield, Ill.

Filed Jul. 29, 1991, Ser. No. 737,220
Int. Cl.[5] B65D *51/00*
U.S. Cl. 220—367 **18 Claims**



1. A fuel cap comprising:

a threaded housing;

a crown covering said threaded housing and having an aperture;

a pressure relief valve carried by said threaded housing; and

interconnecting means for selectively establishing a driving relationship between said threaded housing and said crown and for opening said pressure relief valve,

whereby said interconnecting means is manually operable through said aperture to open said pressure relief valve and simultaneously establish a driving relationship between said threaded housing and said crown in a cap-removal direction, enhancing the safety of said cap.

5,183,174

SPECIALIZED EAR-HANDLED HOLDER-CONTAINER

Dennis E. Quintero, 25 Bon Air Rd., Baltimore, Md. 21225

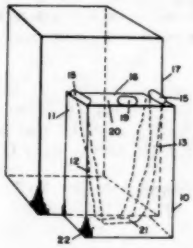
Filed Jun. 29, 1992, Ser. No. 905,813
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—404 **4 Claims**

1. An eared integral holder-container means for receiving handled plastic bags, comprising;

a first larger container and a second smaller holder-container bracket means attached to each other at their sides

said second holder-container being provided with two ear-handled extensions, projecting upwardly from opposing sides of the upper holder-container wall.

the second holder-container of a size to hold within the holder-container substantially all of the plastic bag, except



the bag handles which are spread over the holder-container ear-handles.

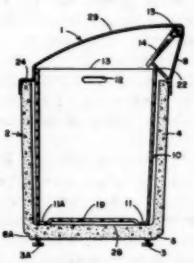
a friction fitting lid for the second holder-container, to enclose the holder-container around substantially all of the plastic bag, with the bag handles remaining outside and over the holder-container ear handles to seal against smells.

5,183,175

TRASH RECEPTACLE ASSEMBLY

Robert L. Brown, P.O. Box 1657, Umatilla, Fla. 43784-1657

Filed Mar. 12, 1992, Ser. No. 850,131
Int. Cl.[5] B65F *1/08*
U.S. Cl. 220—408 **8 Claims**



1. A trash receptacle assembly comprising:

an outer container having a top, a bottom and enclosed sides extending from a periphery of the bottom, said container being open on the top;

a rigid liner for placement inside the outer container, said liner having an open top, a bottom, enclosed sides and being o generally the same shape as the outer container, wherein the sides of the liner extend slightly above the top of the outer container when the liner is placed within said container;

a lid for placement over the outer container and liner, wherein the lid has a trash receiving end;

wherein the outer container contains cut-outs on the top of at least two sides thereof for insertion of the hands to reach the liner which may be placed therein; and

wherein the liner has cut-out hand holes near its open top and on at least two sides thereof, said hand holes align with the cut-outs in the outer container.

5,183,176

LINING FOR RECEPTACLES

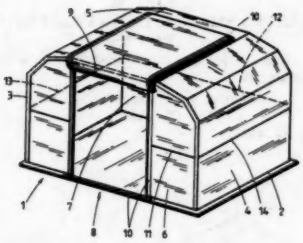
Josef Meier, Borken, and Gottfried Niehaus, Rhede-Vardingholt, both of Fed. Rep. of Germany, assignors to Meier & Niehaus GmbH, Rhebe, Fed. Rep. of Germany

Filed Nov. 9, 1990, Ser. No. 612,582

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1989, 8913412[U]

Int. Cl.[5] B65D *33/14*

U.S. Cl. 220—470 **4 Claims**



1. A lining for a receptacle having a specific inner contour, wherein said lining comprises:

a prefabricated body conforming to said receptacle's inner contour, said body defining a hollow interior for being loaded with goods, said body having a sealable opening to provide access to said hollow interior for loading and unloading of said hollow interior, said body comprised of sheets of insulating material, with a bending fold provided in at least one of said insulating material sheets whereby said body may be folded to be flat, to provide for storage and transportation of said body in a compact manner, in which a flap which seals the opening and surface fasteners to hold the flap in the sealed position are provided in the region of the opening on the hollow body.

5,183,177

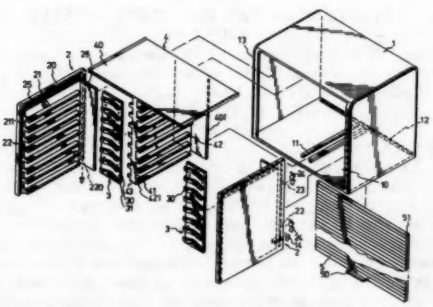
STORAGE BOX FOR ASSORTMENT OF ARTICLES

Jackson Yu, 2F, No. 2, Chung-Hua St., Peitou Dist., Taipei City, Taiwan

Filed May 28, 1992, Ser. No. 890,624

Int. Cl.[5] B65D *85/57, 85/575*

U.S. Cl. 220—523 **10 Claims**



1. A storage box for assortment of articles comprising:

a housing having a top wall, a bottom wall, a right side wall and a left side wall;

a pair of left and right separate plates respectively positioned against said left and right side walls, each of said left and right plates having a top side, a rear side, a front side and a guide rail extending along said rear side, said top side and said front side;

a top plate disposed between and spacing said left and right plates adjacent to said top sides thereof;

a flexible sliding door placed between said left and right plates and having two opposite ends slidably extending into said guide rails of said left and right plates, said sliding door being drawable over said top plate when sliding in said guide rails; and

said left and right plates further having inwardly projecting racks spaced vertically, each rack of said left plate aligned horizontally with the corresponding one of said right plate.

2. A storage box for assortment of articles comprising:

a housing having a top wall, a bottom wall, a right side wall, a left side wall and a rear wall;

a pair of left and right separate plates respectively positioned against said left and right side walls, each of said left and right plates having a top side, a rear side, a front side and a guide rail extending along said rear side, said top side and said front side, said guide rail having a rear end adjacent to said bottom wall of said housing, said left and right plates further having inwardly projecting racks spaced vertically, each rack of said left plate aligned horizontally with the corresponding one of said right plate;

said bottom wall of said housing having an elongated access slot aligned with said rear end of said guide rail of each of said left and right plates;

a flexible sliding door placed between said left and right plates via the passage through said elongated access slot and having two opposite ends slidably extending into said guide rails of said left and right plates;

a resilient stop means provided in said rear end of said guide rail to prevent said sliding door from being released from said guide rail;

each of said left and right plates further having a horizontal groove above said racks and below said guide rail; and

a top plate disposed between said left and right plates and engaging said horizontal grooves.

5,183,178

BULK CONTAINERS

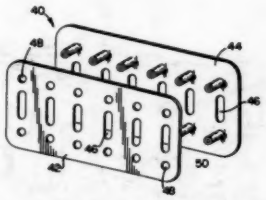
Elvin-Jensen Flemming, 4655 Woodgreen Dr., West Vancouver, Canada

Continuation of Ser. No. 639,055, Jan. 9, 1991, abandoned. This application Jul. 1, 1992, Ser. No. 908,776

Claims priority, application Australia, Sep. 24, 1990, PK2442

Int. Cl.[5] B65D *69/00*

U.S. Cl. 220—650 **14 Claims**



1. A repair device for a container used in the storage of materials, which container is normally transported from location to location by a fork lift truck, the container including sidewalls having elongated ventilation slots therein, a base and an opening in the lower portion of the container below the base with the opening being capable of receiving the tines of a fork lift truck, said device comprising

a pair of separate plates one of which has projecting connector pieces thereon spaced so as to be able to fit through the ventilation slots and the other of which has receiving openings into which said connector pieces can be received and secured to form a robust reinforcing plate; and

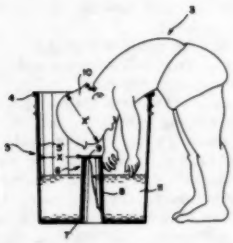
each of said plates comprising slots adapted and arranged for registration with said ventilation slots of said sidewalls.

5,183,179

CHILD DROWNING PROTECTING GUARD FOR AN OPEN HEAD NESTABLE CONTAINER

Glenn H. Morris, Sr., 1192 Cumberland Rd., Chattanooga, Tenn. 37419

Filed Aug. 31, 1992, Ser. No. 937,555
Int. Cl.[5] A65D *3/00*
U.S. Cl. 220—694 **12 Claims**



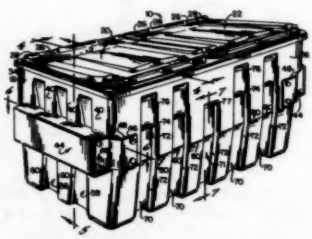
1. A child drowning protection guard for an open head nestable container comprising, an open head, closed bottom, straight sided plastic container, containing a volume of liquid, and a member secured to the bottom of the container and extending upwardly from the container bottom and through the liquid surface a distance at least one-half the height of the container, said member being positioned at the center of the container bottom and being spaced radially inwardly from the side wall of the container, the radial space between the member and the side wall of the container being dimensioned to be less than the diameter of the head of a typical eight month to twelve month old child, whereby when a child leans into the open container the child's head abuts the member to prevent the child from reaching any further into the container, thereby preventing the child from toppling head first into the liquid in the container.

5,183,180

PLASTIC REFUSE CONTAINER

Larry S. Hawkins, Charlotte, N.C., and Ulrich Beese, Wenden-Hünsborn, Fed. Rep. of Germany, assignors to Otto Industries, Inc., Charlotte, N.C.

Filed Dec. 3, 1990, Ser. No. 621,528
Int. Cl.[5] B65D *90/04*
U.S. Cl. 220—908 **24 Claims**



1. A container for receiving waste comprising a polymeric body of generally rectangular shape defined by first and second opposed side walls, a front wall, a rear wall and a bottom wall;

two metal lifting sleeves, each metal lifting sleeve comprising an interior face fastened horizontally on the exterior of each side wall to receive lift forks for lifting the container;

at least a portion of each side wall above and adjacent the lifting sleeve extending outwardly beyond at least a portion of the lifting sleeve for receiving compressive load from at least a portion of the top of the lifting sleeve during lifting of the container; and

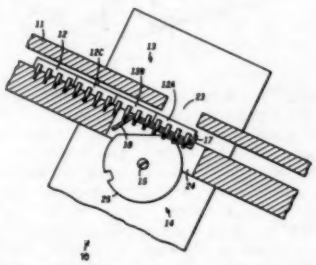
a plurality of vertical reinforcing ribs in each side wall, the vertical reinforcing ribs being defined by side portions of at least one vertical channel integrally formed in the side wall, wherein the vertical channel extends vertically into the horizontal portion of the side wall fastened to the interior face of the lifting sleeve so that at least a portion of the reinforcing ribs are positioned in the side wall behind the lifting sleeve.

5,183,181

SINGULATING ASSEMBLY FOR PRESENTING WORK PIECES

Maureen Sugai, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 27, 1991, Ser. No. 766,376
Int. Cl.[5] A47F *1/04*
U.S. Cl. 221—155 **9 Claims**



1. A singulating assembly for presenting work pieces to an inspection site, comprising:

a track for transporting a plurality of work pieces; and

a means for rotating in both a clockwise and a counterclockwise direction, the means for rotating having a first protrusion to block the track thereby preventing passage of work pieces so that a first work piece in line can be inspected, and having a second protrusion to pin at least one additional work piece against a portion of the track and to resiliently hold said at least one additional work piece in line while simultaneously allowing the first work piece to pass after the first work piece has been inspected.

5,183,182

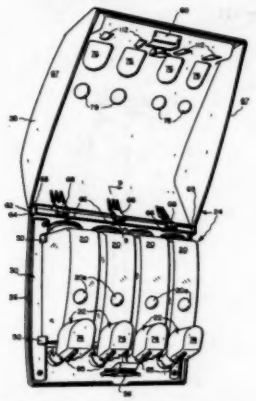
LIQUID DISPENSER FOR VERTICAL WALL MOUNTING

Roger D. Comstock; Ryan K. Tischner, both of Orem, and Wayne E. Pearce, Provo, all of Utah, assignors to Better Living Products, Provo, Utah

Filed Feb. 11, 1991, Ser. No. 653,142
Int. Cl.[5] B67D *5/56*
U.S. Cl. 222—129 **21 Claims**

20. A liquid dispensing device, comprising a shell for enclosing one or more liquid-containing bottles, said shell having a part for receiving and holding said one or more bottles and a cover part for the bottle holding part; one or more elongate bottles adapted to be received and held by said bottle-holding part, each of said one or more bottles having a liquid-dispensing opening at its bottom; valve means removably attached to each of said one or more bottles over said liquid-dispensing opening, each of said valve means including mechanism that is operable back and forth along an axis substantially normal to the longitudinal axis of its associated bottle by means of a push button that is adapted to extend through said cover for manual operation by the user of the device for operating said valve means, and having a downwardly extending, discharge spout through which liquid from its associated bottle will be discharged when the valve means is operated, and resilient means

for returning the push button and valve mechanism to closed position; means whereby said shell can be attached to a wall, with said bottle or bottles positioned substantially vertically; and means on said receiving and holding part of said shell for



individually removably receiving and holding each of said one or more bottles with valve means attached whereby each of said bottles with valve means attached may be individually and easily removed as desired for cleaning, filling, or replacement.

5,183,183

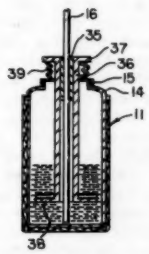
BOTTLE SLING APPARATUS

Trinidad Hernandez, 8467 Oleander Ave., Fontana, Calif. 92335

Filed Dec. 23, 1991, Ser. No. 811,848

Int. Cl.[5] B67D *5/64*

U.S. Cl. 222—175 **3 Claims**



1. A bottle sling apparatus, comprising,

a flexible pouch assembly, the pouch assembly including a first end edge spaced from a second end edge, with the second end edge selectively securable overlying the first end edge, and

a first side edge spaced from a second side edge, the second side edge including a first flap securable to the pouch assembly medially of the first end edge and the second end edge, and

a fluid container received within the pouch assembly, and a mounting ring secured about an upper distal end of the pouch assembly, with the mounting ring including a flexible strap member mounted to diametrically opposed sides of the mounting ring, and the fluid container including a fluid container cap, and a drinking tube directed through the cap extending into the fluid container, and

including a first pocket mounted to an exterior surface of the patch assembly below the mounting ring, where the first pocket includes a second pocket securable in a surmounted relationship relative to the first pocket, and a mounting ring positioned below the first pocket and the second pocket, and

the drinking tube is coaxially directed through the container cap, and a drinking tube support bushing fixedly receives the drinking tube therethrough, and a bushing tube slidably receiving the drinking tube support bushing, the bushing tube slidably received through the container cap in surrounding relationship relative to the drinking tube support bushing, and the bushing tube including a top flange spaced above the container cap, and a bottom flange positioned within the container, and at least one spring member captured between the top flange and the container cap.

5,183,184

LIQUID DISPENSER NOZZLE ASSEMBLY

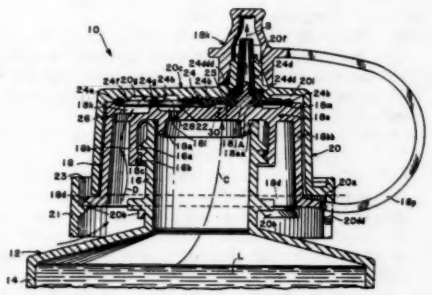
Joseph V. Ranalletta, Guntersville; Fred E. Williams, Jr., Arab, and Rowland W. Kanner, Guntersville, all of Ala., assignors to Ryder International Corporation, Arab, Ala. and pK Scientific, Inc., Frederick, Md.

Continuation-in-part of Ser. No. 406,053, Sep. 11, 1989, Pat. No. 5,025,957, which is a continuation-in-part of Ser. No. 255,365, Oct. 7, 1988, abandoned. This application Mar. 4, 1991, Ser. No. 664,347

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] B67D *5/58, 37/00*

U.S. Cl. 222—189 **10 Claims**



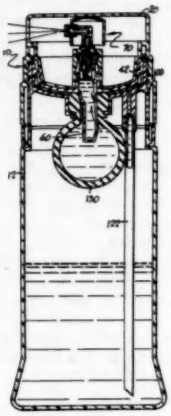
1. A liquid dispensing nozzle assembly for mounting on a liquid container and dispenser having a flexible wall and liquid storage cavity for manually squeezed dispensing of liquid from the cavity through the nozzle assembly and for maintaining the liquid in sterile condition during storage and repeated dispensing of the liquid from the container cavity, said nozzle assembly comprising a liquid discharge port; liquid conduit means for communication from the container cavity to said liquid discharge port to enable dispensing of said liquid through said port during said manually squeezed liquid dispensing; diaphragm means integrally including a deflectable valve element for biased sealing against a valve seat in said nozzle assembly to form a one-way valve therewith allowing only one-way flow of liquid therebetween when said valve element is resiliently unseated from said valve seat to open said valve, and a tubular portion integrally formed with said valve element such that said resilient unseating of said valve element to open said valve permits said liquid flow past said valve element into said tubular portion for discharge therefrom, and said tubular portion includes an annular column portion, wherein said column portion includes first and second generally axially opposing annular surfaces for compressed sealing against respective surfaces of said nozzle assembly, and wherein one of said first and second annular column surfaces defines said deflectable valve element.

5,183,185

MECHANICALLY PRESSURIZED DISPENSER SYSTEM

Jerry D. Hutcheson, Littleton, Colo., and William S. Blake, Linwood, N.J., assignors to Ecopac, L. P., Engelwood, Colo.

Filed Feb. 14, 1991, Ser. No. 656,195
Int. Cl.[5] B65D *37/00, 88/54*
U.S. Cl. 222—209 35 Claims



1. A mechanically pressurized system for dispensing a product, comprising:

(a) a cap having an interior cavity,

(b) a cylindrically shaped piston closed at one end and having a face at said end, said piston being seated in said cap and disposed so that the face of the piston is within the interior cavity of said cap, said face having a circular cross section,

(c) a cylindrically shaped actuator having a side wall and a floor, said actuator moveably attached to said cap for movement of the cap relative to the actuator in a first direction along the axis of said piston and for movement of the cap relative to the actuator in a second direction along the axis of said piston, the actuator and cap being referred to herein, when so attached to one another, as a dispensing head assembly,

(d) a charging chamber contained within the dispensing head assembly, said charging chamber having a floor, a side wall, and a top, which are defined by the floor of the actuator, the side wall of the actuator, and the face of the piston, respectively, wherein movement of the cap relative to the actuator in said first direction raises the piston and opens the charging chamber, and movement of the cap relative to the actuator in said second direction lowers the piston and closes the charging chamber,

(e) inlet means, including a dip tube having a first end and a second end, said first end being in fluid communication with a product source containing said product, and said second end being in fluid communication with the charging chamber for moving the product into the charging chamber from the product source as the charging chamber is opened,

(f) expanding resistant reservoir means in fluid communication with the charging chamber for receiving product from the charging chamber as the charging chamber is closed, said reservoir means expanding to hold the product against a force of resistance, and

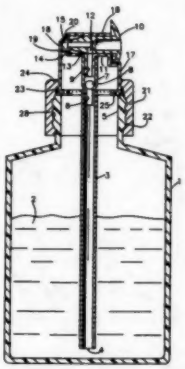
(g) outlet means in fluid communication with the expanding resistant reservoir means for moving product out of the expanding resistant reservoir means whereby said force of resistance is used to move said product.

5,183,186

SPRAY DISPENSING DEVICE HAVING A TAPERED MIXING CHAMBER

Henry W. Delaney, Jr., North Branford, Conn., assignor to Emson Research Inc., Bridgeport, Conn.

Filed Aug. 15, 1991, Ser. No. 745,538
Int. Cl.[5] B65D *37/00*
U.S. Cl. 222—211 13 Claims



1. A spray dispensing device, for use with a non-pressurized container holding a volume of a liquid and air above the liquid wherein said container is actuated to increase air pressure within said container and to force liquid through a dip tube of the spray dispensing device, the spray dispensing device comprising:

a dispenser housing defining a cavity therein, with an air orifice and a liquid orifice being defined through an underside wall of said housing and a spray orifice being defined through a peripheral wall of said housing;

a dip tube extending from the underside wall and communicating with said liquid orifice; and

a valve received in said cavity defining a mixing chamber in said cavity between the spray orifice and the valve, a liquid passageway defined in said valve and communicating with said mixing chamber, and an air passageway defined between said valve and said underside wall and communicating with said mixing chamber, said valve being selectively movable within said cavity between, at least: a first position wherein the air passageway communicates with the air orifice and wherein the liquid passageway communicates with the liquid orifice and the dip tube to define a first extent of communication between the dip tube and the mixing chamber, whereby a first stream of air can pass through said air orifice, through said air passageway and into said mixing chamber at a first air flow rate, and a first stream of liquid can pass through into dip tube, through said liquid orifice, through said liquid passageway and into said mixing chamber at a first liquid flow rate to engage the first stream of air such that a liquid-air mixture, characterized by a first ratio of liquid to air, can emanate from the spray orifice as a spray; and a second position wherein the air passageway communicates with the air orifice and wherein the liquid passageway communicates with the liquid orifice and the dip tube to define a second extent of communication between the dip tube and the mixing chamber which is greater than said first content, whereby a second stream of air can pass through said air orifice, through said air passageway and into said mixing chamber at a second air flow rate which is equal to said first air flow rate, and a second stream of liquid can pass through said dip tube, through said liquid orifice, through said liquid passageway and into said mixing chamber at a second liquid flow rate, greater than said first liquid flow

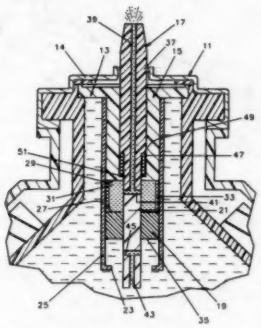
rate, to engage the second stream of air such that a liquid-air mixture, characterized by a second ratio of liquid to air which is greater than said first ratio, can emanate from the spray orifice as a spray.

5,183,187

PISTON OPERATED FLUID DISPENSING DEVICE

James H. Martin, and Samuel J. Garro, both of c/o The Mahagawa Corporation, P.O. Box 478, Wadsworth, Ohio 44281

Filed Jun. 10, 1991, Ser. No. 712,677
Int. Cl.[5] B65D *37/00, 83/14*
U.S. Cl. 222—287 **6 Claims**



1. Dispensing apparatus for dispensing a predetermined quantity of a pressurized fluid comprising:

a container for pressurized fluid;

a valve assembly extending into said container from an end thereof;

a body portion of said valve assembly;

a manually actuatable elongated stem member mounted for reciprocation in said valve assembly and having a first end thereof extending out of said container;

a first passageway formed in said stem member and extending from the first end thereof to a point intermediate the ends thereof, said first passageway having an outlet to the side of said stem member at its end away from the first end of said stem member;

a second passageway formed in said stem member and extending from a second end thereof to a point intermediate the second end of said stem member and said outlet of said first passageway, said second passageway having an outlet to the side of said stem member at its end away from the second end of said stem member;

a piston mounted for reciprocable motion over a portion of said stem member adjacent the second end thereof, said piston extending along said stem member a distance less than the length of said second passageway;

first bias spring means to maintain said piston in proximity to the second end of said stem member when said stem member is not actuated, said first bias spring means producing a force under compression that is less than the force produced by the action of the pressurized liquid on the surface of said piston facing toward said second end of said stem member;

a chamber formed between the surface of said piston facing toward the first end of said stem member and an opposing surface formed on said body portion of said valve assembly, said chamber having a size, when said piston is positioned in proximity to the second end of said stem member, to contain at least the predetermined quantity of the pressurized liquid; and

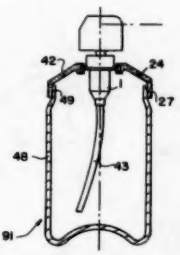
second bias spring means located between opposing shoulders on said body portion and said stem member to maintain said stem member in the unactuated position when no manual force is applied, in this unactuated position said outlet of said second passageway is in conjunction with said chamber while said outlet of said first passageway is not, but upon manual actuation of said stem member said outlet of said first passageway is moved into conjunction with said chamber while said outlet of said second passageway is moved out of conjunction with said chamber.

5,183,188

METHOD OF MAKING A DISPENSING HEAD, AND THE CORRESPONDING HEAD AND DISPENSER

Michel Rebeyrolle, and Bernard Schneider, both of St. Menehould, France, assignors to Cebal, Clichy, France

Filed Oct. 31, 1990, Ser. No. 606,903
Claims priority, application France, Nov. 2, 1989, 89 14731
Int. Cl.[5] B67D *5/40*
U.S. Cl. 222—383 **12 Claims**



1. A dispensing head (**40**; **42**) to be fixed on a rigid tubular can body (**46**; **48**; **60**; **70**; **80**), and comprising an annular dome (**24**; **85**) made of generally rigid plastic, and a valve (**100**) or pump (**1**), means non-removably fixing said valve (**100**) or pump (**1**) to the dome (**24**; **85**), said means comprising an annular shoulder (**2**) of said valve (**100**) or pump (**1**) molded into said dome in a central portion of the dome, said dispensing head (**40**, **42**) further comprising only the following portions in an outward direction from the central portion:

an upper annular portion (**35**, **36**) comprising an inner enlarged portion (**35**) which encloses the annular shoulder (**2**), gripping the shoulder over a width of at least 0.8 mm;

a dome portion in the form of a frusticonical shell (**34**) with an outwardly increasing diameter and a generally thickness of 1.2 to 4 mm; and

a bottom portion (**27**; **41**; **83** and **84**) for fixing onto the rigid tubular can body (**46**; **48**; **60**; **70**; **80**), the bottom portion extending from the frusticonical shell (**34**) and comprising an annular means (**27**; **37**; **83** and **84**) for fixing onto the generally upper end (**44**; **49**; **61**; **71**; **81**) of the rigid tubular body of the can.

5,183,189

CONTROL VALUE FOR A CONTAINER CONTAINING A FLUID UNDER GASEOUS PRESSURE AND CONTAINER PROVIDED WITH A VALUE OF THIS KIND

Gilles Baudin, Clichy, France, assignor to L'Oreal, Paris, France

Filed Oct. 3, 1991, Ser. No. 770,406
Claims priority, application France, Nov. 9, 1990, 90 13916
Int. Cl.[5] B65D *83/70*
U.S. Cl. 222—397 **11 Claims**

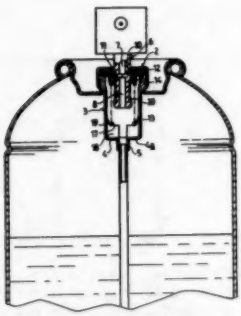
1. A control valve for a container containing a fluid under gaseous pressure comprising:

a valve stem moveable in a valve body, said stem having an axis and being provided along said axis with two opposing recessed channels each leading to an opposite end of said valve stem, said channels being separated by a base and said stem having a lateral wall with transverse orifices being located in said lateral wall on opposite sides of said

base, each of said orifices communicating respectively with one of said channels, one of said channels being remote from said valve body and forming with said transverse orifice associated therewith a dispensing passageway, the other said channels being associated with the other said transverse orifice which together form an evacuation passageway;

said control valve further including a sealing member having an opening for receiving said valve stem;

a first spring being provided to force said valve stem relative to said valve body in a direction corresponding to an outward movement of said stem relative to said valve body and a second spring disposed so as to prevent outward movement of said stem so long as the pressure in the interior of the container does not exceed a predetermined value, wherein a user by pressing on the stem brings said dispensing passageway into communication with an interior of said valve body to effect the dispensing of the product and that, in the event of abnormal excess pressure, said second spring is compressed to raise said valve stem to bring said evacuation passageway into communication with the atmosphere external to said valve body to prevent the container from exploding and wherein said first and second springs are disposed in parallel with said first spring and second spring having one end each respectively engaging an abutment means, said valve stem having a stop member for engaging said abutment means when said valve stem is moved into said valve body by a user, said abutment means being slidable relative to said valve stem upon outward movement of said valve stem relative to said valve body, said first spring having a second end resting against another stop member disposed in said valve body while said second spring has a second end engaging a stop integral with said valve stem.



5,183,190

FOLDABLE GARMENT DISPLAY HANGER

Andrew M. Zuckerman, Forest Hills, N.Y., assignor to Different Dimensions, Inc., Rego Park, N.Y.

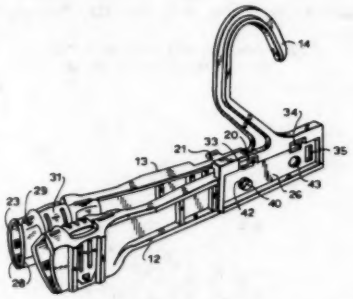
Filed Nov. 26, 1991, Ser. No. 798,499
Int. Cl.[5] A47G *25/48, 25/28*
U.S. Cl. 223—96 **15 Claims**

1. A foldable garment hanger, comprising:

(a) a body and a hanging means, said body having a length along a generally horizontal axis when said hanger is suspended by said hanging means;

(b) said body comprising two substantially rigid extended body arms, each arm having a free end and a base, each arm having retaining means adjacent its free end for securing garments during both shipping and display, and each arm constituting a portion of said length of said body, said body arms being connected one to another at their respective bases by a living hinge, so that said body arms may be folded together and positioned in side-by-side relation to decrease said length of said body;

(c) said hanging means comprising a suspension member and a widened collar, said collar being attached to the lower edge of one of said body arms adjacent to said hanger body living hinge, along the edge of said collar opposite said suspension member, this attachment being via another living hinge so that said suspension member and collar may be folded, inverted and positioned in side-by-side relation to said attached body arm or body arms; and



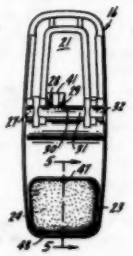
(d) latching means for securing said suspension member and collar to said hanger body when said suspension member and collar are folded about said suspension member living hinge, for use in display hanging.

5,183,191

HANGERS WITH LONG LASTING NON-SLIP SURFACES

Judd F. Garrison, Grand Rapids, and Russell O. Blanchard, Zeeland, both of Mich., assignors to Batts, Inc., Zeeland, Mich.

Filed Feb. 6, 1992, Ser. No. 832,060
Int. Cl.[5] A47G *25/48, 25/14*
U.S. Cl. 223—96 **28 Claims**



15. An improved clamp-type garment hanger, the hanger including

hang means,

a cross-bar having two ends,

the hang means extending upwardly from a central area of the cross-bar for suspending the garment hanger from a support location,

garment suspending means including two clamp assemblies, one clamp assembly located at each end of the cross-bar for securing a pant or skirt to the garment hanger,

each clamp assembly including a front clamping member and a rear clamping member,

each of the front and rear clamping members including an outer surface and an inner clamping surface,

each of the outer surfaces of the front and rear clamping members including a recessed channel for accommodating a U-shaped clamp,

the U-shaped clamp resiliently urging the front and rear clamping members into a garment clamping position,

the rear clamping member including two downwardly extending fingers and being an integral extension of the cross-bar and being stationary with respect to the cross-bar, the two downwardly extending fingers being laterally spaced from one another,

the front clamping member including one downwardly extending finger, the one downwardly extending finger of the front clamping member being aligned to fall in between the two downwardly extending fingers of the rear clamping member in the garment clamping position,

each downwardly extending finger including an inner clamping surface,

at least one inner clamping surface including at least one resilient pad,

a first side of the resilient pad being secured to and carried by the inner clamping surface of one of the downwardly extending fingers, a second side of the resilient pad being presented for contact with a garment to be hung from the hanger,

the resilient pad being fabricated from resilient friction material,

the resilient friction material comprising a block copolymer having discreet block segments of styrene monomer units and rubber monomer units,

the co-efficient of friction of the second side of the resilient pad being sufficiently high to preclude movement under the weight of the garment when a normal clamping force is applied to the two clamping members to move them into clamping position.

5,183,192

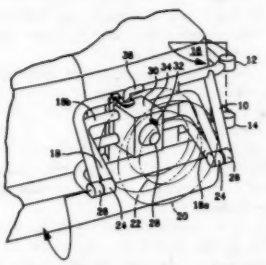
SPARE TIRE LOWERING SYSTEM

Joseph E. Mrozowski, Del Mar; Jeffery K. Fusco, La Jolla, and Alfonso Albaisa, San Diego, all of Calif., assignors to Nissan Design International, Inc., San Diego, Calif.

Filed Jul. 25, 1991, Ser. No. 735,880

Int. Cl.[5] B62D *43/00*

U.S. Cl. 224—42.21 **9 Claims**



1. A spare tire lowering system for a vehicle, comprising:

a primary rack including a first pair of generally U-shaped members each having an intermediate portion and first and second leg portions extending from opposite ends of the intermediate portion, the intermediate portions being spaced apart and generally parallel; said first leg portions converging together to form a first terminal end and said second leg portions covering together to form a second terminal end;

means for mounting an end of the primary rack to a rear corner of a body of the vehicle so that the primary rack can pivot about a substantially vertical axis;

a secondary rack including a second pair of generally U-shaped members each having an intermediate portion and third and fourth leg portions extending from opposite ends of the intermediate portion, the intermediate portions being spaced apart and generally parallel; said third leg portions converging together to form a third terminal end and said fourth leg portions converging together to form a fourth terminal end;

hub means connected between the intermediate portions of the U-shaped members of the secondary rack for having a wheel of a spare tire mounted over the same;

means for releasably holding the wheel of the spare time over the hub means; and

means for hingedly connecting at least one of said third and fourth terminal ends of the U-shaped members of the secondary rack to at least one of said first and second terminal ends of the U-shaped members of the primary rack for enabling rotation of the secondary rack about a substantially horizontal axis between a raised configuration in which the spare tire is elevated off of a road surface on which the vehicle rests and a lowered configuration in which the spare tire also rests on the road surface.

5,183,193

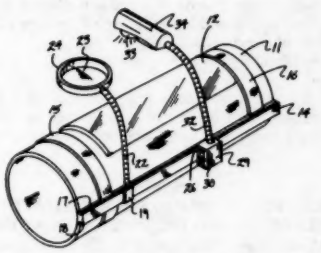
WRIST MOUNTED MAP HOLDER APPARATUS

Bernie Brandell, 1179 51st St., Brooklyn, N.Y. 11219

Filed Aug. 6, 1991, Ser. No. 740,713

Int. Cl.[5] A45F *5/00*

U.S. Cl. 224—219 **4 Claims**



1. A wrist mounted map holder apparatus, comprising,

an elongate, elastomeric flexible cylindrical sleeve, the sleeve including a transparent pocket mounted to an exterior surface of the sleeve, wherein the transparent pocket includes a lower terminal end and an upper terminal end adjacent opposed upper and lower terminal ends of the sleeve, wherein the transparent pocket upper terminal end includes an entrance slot for reception of a map therewithin permitting viewing of the map within the pocket, and

a rigid support bar, the rigid support bar including a first strap and a second strap, the first strap including a first terminal end and a second terminal end, including respective first and second hook and loop fastener patches for securement together for securement about the sleeve, and wherein the second strap includes a third and fourth terminal end, wherein the third and fourth terminal end include respective third and fourth hook and loop fastener patches securable together for securement of the second strap about the sleeve, and magnification means mounted to the rigid support bar and positioned for viewing the map mounted within the transparent pocket.

5,183,194

GARMENT WEIGHT TRANSFER APPARATUS

Hossain A. Shirdavani, 14425 NE. 37th Pl., Bellevue, Wash. 98007

Filed Dec. 31, 1991, Ser. No. 816,617

Int. Cl.[5] A45F *3/00*

U.S. Cl. 224—224 **1 Claim**

1. Garment weight transfer apparatus, said apparatus comprising:

a saddle, comprising first and second pads, each of said pads having first and second ends, and first and second adjust-

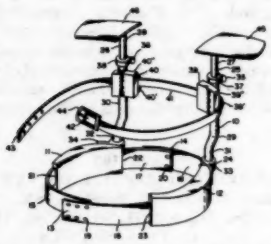
able belts, said first belt interconnecting said first ends of said pads, said second belt interconnecting said second ends of said pads,

first and second adjustable length uprights, each of said uprights having a top end and a bottom end,

first and second shoulder guards,

said bottom ends of said uprights being attached to said saddle

said top end of said first upright being attached to said first



shoulder guard and said top end of said second upright being attached to said second shoulder guard wherein said shoulder guards are sized and adapted to be spaced above and extend laterally across the tops of the shoulders of a nearer,

third and fourth pads and

a strap,

said third and fourth pads being slidably attached to said strap, said third pad being attached to said first upright and said fourth pad being attached to said second upright.

5,183,195

DEVICE FOR STAPLING SHEETS INDIVIDUALLY SUPPLIED AND DEPOSITED ON A STACK

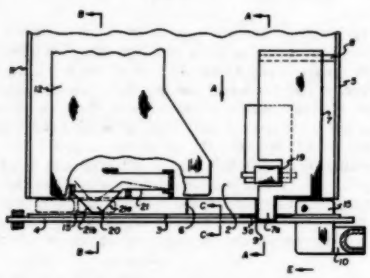
Franz Allmendinger, Eichwald; Arno Ebner, Ammerbuch; Helmut Ettischer, Ostfildern, and Timo Straub, Geislingen-Aufhausen, all of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 19, 1992, Ser. No. 837,122

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1991, 4107755

Int. Cl.[5] B27F *7/17*

U.S. Cl. 227—29 **11 Claims**



1. A device for stapling sheets comprising a collecting tray having a support surface including abutments for aligning said sheets in an accurate position, and a free space defined between said support surface and a front abutment, said device further comprising a stapling unit which is movable parallel with said front abutment to a number of different stapling positions along said free space, characterized by a pivotal hold-down element (7) which is mounted in an area of a sheet stack (14) where a staple is to be applied and pivotable in a direction of the height of the sheet stack, said hold-down element (7) having a tongue (7*a*) at a free end, said tongue (7*a*) being arranged in an area of the sheet stack (14) where no staple is to be applied, and overlapping said free space (6), said tongue (7*a*) extending into an area of free passage of said stapling unit (15), and a flexible cover element (20) extending into the path of movement of said stapling unit.

5,183,196

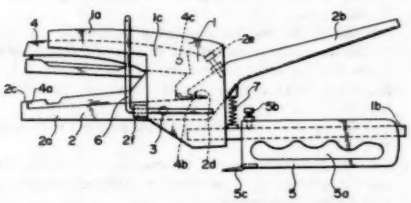
STAPLER ASSISTOR

Mitsuo Miyashita, 67-72, Matsugo, Tokorozawa-shi, Saitama-ken, Japan

Filed Dec. 26, 1991, Ser. No. 813,605

Int. Cl.[5] B25C *5/02*

U.S. Cl. 227—63 **10 Claims**



1. A stapler assistor for assisting the driving and holding of a stapler apparatus, said stapler apparatus having a V-shaped opening with a maximum opening angle and a staple remover at the rear end thereof, comprising:

a first lever having an upper jaw at one end thereof and a lower handle at the opposite end thereof;

a second lever having a lower jaw at one end thereof and an upper handle at the opposite end thereof, said lower jaw having a slit therein for receiving the staple remover of said stapler apparatus, said upper and lower jaws defining therebetween a V-shaped opening for receiving said stapler apparatus with the V-shaped opening of said stapler apparatus oriented in the same direction as the V-shaped opening defined by said upper and lower jaws, said first and second levers crossing each other at intermediate portions thereof, the V-shaped opening between said upper and lower jaws having a maximum opening angle;

a shaft pivotally connecting said first and second levers at said intermediate portions;

a stopper projection, said stopper projection being located on a front end of said lower jaw, said stopper projection retaining said stapler apparatus between said upper and lower jaws;

a plurality of protrusions formed on at least one of said upper and lower jaws, said protrusions preventing said stapler apparatus from moving laterally within said upper and lower jaws; and

a stopper formed from a bar slidably received in longitudinal through-bores formed in bosses provided on both sides of said lower jaw and bent at intermediate portions so as to bridge over said upper jaw, said stopper limiting the depth of insertion of an object into said stapler.

5,183,197

BUNDLE AND PLACE METHOD FOR THE MANUFACTURE OF BRUSH SEALS

Harold Howe, Orlando, Fla., assignor to Technetics Corp., Deland, Fla.

Filed Aug. 7, 1991, Ser. No. 741,768

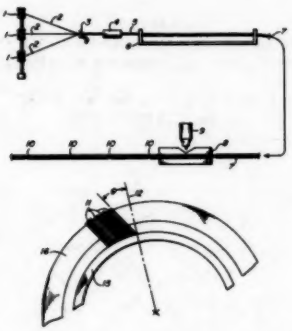
Int. Cl.[5] B21D *39/00*

U.S. Cl. 228—160 **10 Claims**

1. In the formation of a flexible linear array of parallelly aligned, contiguous bristles, for use in the production of a brush seal, the improvement which comprises;

providing a multitude of bundles of tightly packed bristles, the bristles of each such bundle being joined at one end thereof,

placing the bundles on a member to form a linear brush array, such that the long axes of the bristles in the array are parallel to each other, said member maintaining the bundles in such an array,



applying a material capable of forming a resilient backing at the joined-end portion of each of the bundles, whereby the backing acts as a flexible connector to maintain the bundles in the form of the linear brush array.

5,183,198

METHOD OF PRODUCING CLAD STEEL PLATE HAVING GOOD LOW-TEMPERATURE TOUGHNESS

Hiroshi Tamehiro; Yoshinori Ogata, and Yoshio Terada, all of Kimitsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 15, 1991, Ser. No. 793,959
Claims priority, application Japan, Nov. 28, 1990, 2-328310
Int. Cl.[5] B23K *31/02*
U.S. Cl. 228—186 **4 Claims**

1. A method of producing clad steel plate comprising the steps of obtaining an assembly slab by superposing a stainless steel cladding material and a base metal consisting essentially of, by weight,

Carbon	0.020 to 0.06%
Silicon	0.5% or less
Manganese	1.0 to 1.8%
Phosphorus	0.03% or less
Sulfur	0.005% or less
Niobium	0.08 to 0.15%
Titanium	0.005 to 0.03%
Aluminum	0.05% or less
Nitrogen	0.002 to 0.006%

with the balance being iron and unavoidable impurities;

seal-welding the periphery of the assembly slab;

heating the slab to a temperature in the range of 1100° to 1250° C.;

rolling the slab at a reduction ratio of 5 or more;

rolling the slab at a finish temperature of 900° to 1050° C.;

air cooling the slab for 60 to 200 seconds to promote recrystallization of γ structure;

cooling the slab from a temperature of at least 750° to an arbitrary temperature of 550° or below at a cooling rate of 5° to 40° C./sec; and

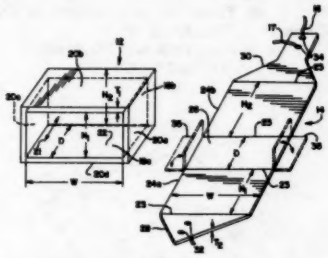
air cooling the slab.

5,183,199

CONTAINER DEVICE AND METHOD FOR MAKING SAME

Maria L. Bills, 3368 S. Parnell, Chicago, Ill. 60616

Filed Jan. 22, 1992, Ser. No. 823,754
Int. Cl.[5] B65D *3/00*
U.S. Cl. 229—23 A **17 Claims**



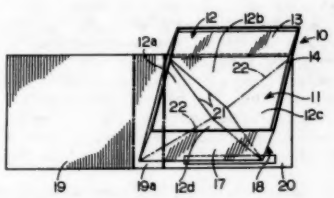
1. A container comprising, in combination, a sleeve-like member having a plurality of interconnected wall panels defining an interior storage cavity having two open ends, a foldable insert member adapted to be inserted through the storage cavity from at least one of the open ends and foldably divided into a support panel and a plurality of foldable end flaps, the support panel being interposed between the foldable end flaps and adapted to lie against an inside surface of a selected wall panel, the end flaps being foldable to substantially cover the open ends, and means coupled to the foldable insert member for securing the end flaps over the two open ends to form a substantially closed enclosure about the storage cavity.

5,183,200

FOLDER TYPE PAPER BOX

Haruo Okamoto, 1291-133, Oaza Yokose, Oita-shi, Oita 870-11, Japan

Filed Sep. 9, 1991, Ser. No. 756,960
Claims priority, application Japan, Oct. 18, 1990, 2-109540[U]
Int. Cl.[5] B65D *5/36*
U.S. Cl. 229—23 R **12 Claims**



1. A folder type box, comprising:

a box container and a lid body for fitting on said box container, said box container and lid body each comprising:

a quadrangular bottom plate having a rift running through a first pair of opposite angles formed thereon so as to form first and second bottom plate portions adjacent said rift, and a linear fold running through a center of a second pair of opposite angles of said first and second bottom plate portions; and

a side plate connected to said quadrangular bottom plate; said folder type box further comprising:

a back plate fixed to said second portion of said bottom plate, said second portion separable from said first portion along said rift such that said box container and said lid body can each lay flat in a flat state; and

means for bonding said second portion of said bottom plate separated along said rift to said back plate when said first

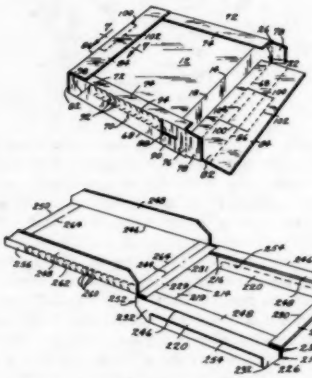
and second portions of said bottom plate are brought together to close said rift such that said folder type box can be transformed from said flat state to a box state by a bond of said means for bonding.

5,183,201

CARTON TRAY WITH IMPROVED CORNER CONSTRUCTION AND METHOD OF MAKING

Richard F. Gulliver, Tuscaloosa, Ala., assignor to Gulf States Paper Corporation, Tuscaloosa, Ala.

Filed Nov. 22, 1991, Ser. No. 796,599
Int. Cl.[5] B65D *5/24, 5/46*
U.S. Cl. 229—117.12 **26 Claims**



1. A carton tray suitable to retain consumable contents therein containing liquid so that the contents can be (1) heated in an oven while retained therein and (2) thereafter consumed while retained therein, said carton tray being formed from a flat carton blank including

a bottom wall panel having a periphery defined along four sides by four side fold lines interrelated so that there are four different pairs of adjacent side fold lines wherein each pair of adjacent side fold lines extends at an angle with respect to each other from a corner point defining one of four corners of said bottom wall panel,

four side wall panels integral with said bottom wall panel along said four side fold lines interrelated so that there are four different pairs of adjacent side wall panels,

a gusset wall panel integral with each pair of adjacent side wall panels along two end fold lines extending in angularly related relation with respect to one another from the corner point associated with the pair of adjacent fold lines with which said pair of adjacent side wall panels is integral,

said side wall panels being folded along said side fold lines in a direction which is the same relative to said bottom wall panel into an erected position while each of said gusset wall panels is folded along the associated angularly related end fold lines in opposite directions with respect to the associated pair of adjacent side wall panels so as to bring each gusset wall panel into surface-to-surface abutting relation with an end portion of one of the associated pair of adjacent side wall panels defined by one of the associated two end fold lines, and

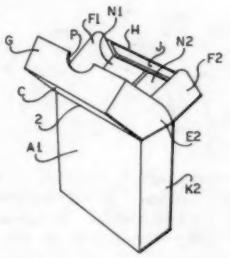
an adhesive adhering each of said gusset wall panels in surface-to-surface abutting relation with the associated one side wall end portion to thereby form a sealed integral corner construction between each pair of adjacent side wall panels which is defined (1) exteriorly by the associated gusset wall panel adhesively adhered in abutting relation to the associated one side wall end portion with the associated one end fold line extending generally in a plane coincident with an interior surface of the associated one side wall panel from the associated corner point and (2) interiorly by another of the associated two end fold lines extending from the associated corner point generally along the interior surface of the associated one side wall panel.

5,183,202

RECLOSABLE DISPENSER CARTON

Marc C. Love, Goshen, Ind., assignor to Atlas Die, Inc., Elkhart, Ind.

Filed Nov. 8, 1991, Ser. No. 789,327
Int. Cl.[5] B65D *5/66*
U.S. Cl. 229—123 **5 Claims**



1. A carton formed from a unitary carton blank, comprising:

rectangular shaped lower front, lower back, bottom and lower side panels connected along a plurality of crease lines; and

an overlapping double closure means for providing reclosable access to the contents of said carton, said overlapping double closure means including

(a) a front outer closure including an upper front panel, a top panel and a pair of upper side panels, said upper front panel hingedly connected to said front panel along a first of said crease lines, and

(b) a rear inner closure including an upper front panel, a top panel and a pair of upper side panels, said rear inner closure upper front panel hingedly connected to said lower back panel along a second of said crease lines, said rear inner closure received within said front outer closure when said carton is closed, each of said closures further having a pair of guide flaps extending from said upper side panels, said guide flaps retracting within said lower side panels when said closures are closed and extending therefrom when said closures are opened, said guide flaps on said front outer closure overlapping said guide flaps on said rear inner closure.

5,183,203

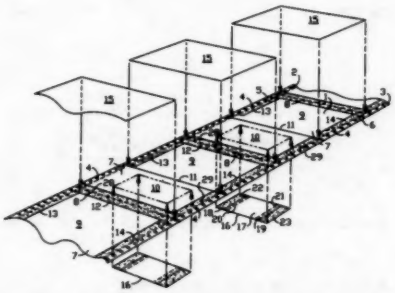
MULTIPLE PURPOSE CERTIFIED MAIL ENVELOPE ASSEMBLY

Raymond W. Sanders, 6368 Sharlene Dr., Cincinnati, Ohio 45248

Filed Oct. 3, 1991, Ser. No. 770,797
Int. Cl.[5] B65D *27/00*
U.S. Cl. 229—300 **13 Claims**

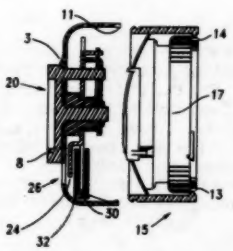
1. A continuous strip of Certified Mail envelope assemblies for feeding through a computer printer, said continuous strip comprising a continuous first paper ply having a front surface and a rear surface and continuous longitudinal edges, said first ply being divided longitudinally into equal length segments by transversely extending lines of perforations, each such segment being divided into first and second portions by a transversely extending fold line, each first portion comprising an envelope assembly front panel, each second portion comprising an envelope assembly closure flap, a second ply comprising discrete paper sheets equal in number to the number of said envelope

assembly front panels, each second ply sheet having a front surface and a rear surface, each second ply sheet having its rear surface glued to said rear surface of its respective front panel longitudinally of said strip along the sides thereof and transversely of said strip near the adjacent one of said transverse lines of perforations, each second ply sheet comprising the rear panel of its envelope assembly, each envelope assembly having an envelope opening between its front and rear panels extending transversely of said strip adjacent said fold line between its respective front panel and closure flap, a return receipt card having front and rear surfaces being removably affixed to said front surface of each envelope assembly flap, said rear surface



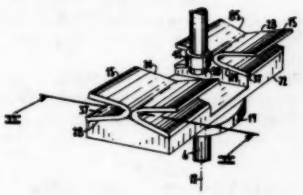
of said return receipt card facing said front surface of its respective flap and having the sender's address pre-printed thereon, bands of remoistenable glue on said rear surface of each envelope assembly closure flap for adhering said rear surface of said flap to said front surface of its respective rear panel to close said envelope opening, a Certified Mail endorsement being pre-printed on each front panel centrally thereof and adjacent its respective fold line, a return receipt request pre-printed on each front panel adjacent and beneath its Certified Mail endorsement, each envelope assembly being severable from said strip along that transverse line of perforations between its closure flap and the front panel of the next adjacent envelope assembly.

5,183,204
MIMETIC THERMOSTAT
Wayne T. Kelly, 1516 E. Main St., Unit 7, Meriden, Conn. 06450, and Steven L. Levy, Main St., Woodbury, Conn. 06798
Filed Mar. 9, 1992, Ser. No. 848,315
Int. Cl.[5] G01K *1/00*
U.S. Cl. 236—94 **5 Claims**



1. A mimetic thermostat which is not interconnected to a building's heating/cooling system comprising a housing, temperature setting means and temperature reading means, two temperature gradients; the first of said two temperature gradients is made part of said temperature setting means, the second of said two temperature gradients is made part of a temperature reading indicator, a viscous fluid dampening means to dampen temperature reading indicator in response to movement of temperature setting means, and a wall mounting means collectively forming an interacting mechanical system acting to provide an illusion of actual vs. set temperature.

5,183,205
CENTRIFUGAL NOZZLE
Paul Hoffman, 4125 Ricklyn Dr., Chambersburg, Pa. 17201
Filed Nov. 14, 1991, Ser. No. 791,558
Int. Cl.[5] B05B *3/10*
U.S. Cl. 239—222.13 **19 Claims**



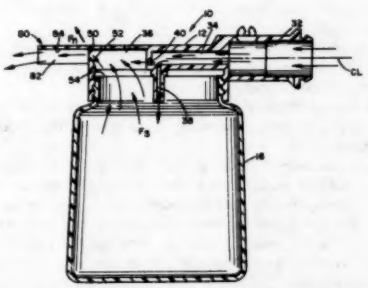
1. A centrifugal spray apparatus, comprising:

a rotatable shaft defining a rotation axis and means for rotating the shaft in a rotation direction around the axis;

a vane coupled to the shaft and oriented perpendicular to the rotation axis, the vane being elongated substantially radially from the rotation axis, the vane defining a heel end at a first radial distance from the rotation axis, a toe end at a second and radially greater distance from the rotation axis, and a front face in a direction of rotation, the vane moving in a plane upon rotation of the shaft; and,

an injector having an outlet port and being operable for emitting a substance stream from the outlet port along a path substantially in the plane of the vane and in a direction causing the vane to intersect the substance stream progressively from the heel end to the toe end as the vane rotates and from a trailing end to a leading end of a stream segment intersected by the vane, the stream segment being guided along the front face of the vane and ejected along an arc which is substantially in the plane.

5,183,206
SPRAY NOZZLE
Daniel J. Gavin, 7873 Kellogg Creek, Mentor, Ohio 44060
Filed Jun. 5, 1991, Ser. No. 710,560
Int. Cl.[5] B05B *7/28, 1/26*
U.S. Cl. 239—317 **34 Claims**



1. A spray nozzle apparatus adapted for use with a fluid supply source and a reservoir having an opening, the apparatus comprising:

a housing defining a mixing chamber therein;

means for coupling the reservoir to the housing at the opening;

input communicating means for communicating a supply of

a first fluid from the fluid supply source into the housing through an elongate passageway having a substantially columnar first surface;

first passage means for communicating a first portion of the first fluid from the input communicating means into the reservoir as a mixing fluid flow;

second passage means for communicating the remaining portion of the first fluid from the input communicating means into the mixing chamber as a drawing fluid flow having a substantially columnar path, said second passage means being defined at least in part by said first surface;

fluid reflecting means for reflecting the drawing fluid flow and the mixing fluid flow as a first reflected fluid flow, the reflecting means being positioned substantially within the columnar path; and,

outlet reflecting means for guiding the first reflected fluid flow into a spray pattern, said outlet reflecting means being offset from said columnar path.

5,183,207

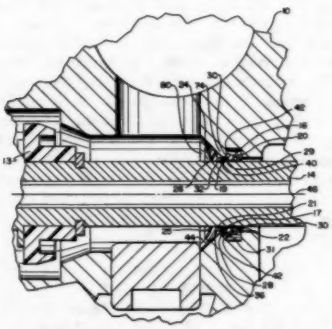
AIR SEAL FOR PAINT GUNS

Timothy D. Steinberg, Coon Rapids, and Richard W. Gunderson, Elk River, both of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Nov. 14, 1991, Ser. No. 792,175

Int. Cl.[5] B05B *7/02, 1/28*

U.S. Cl. 239—526 **15 Claims**



1. In a portable paint gun of the type having a housing with a passage containing a control valve mounted on an axially movable shaft for controlling pressurized air to atomize a stream of paint, an improved sealing ring in combination therewith comprising:

the paint gun housing having a chamber carrying a control shaft and a radially inwardly extending wall at one end of the chamber; and

b) a sealing ring interposed between the control shaft and the radially inwardly extending housing wall, the sealing ring having:

i. a generally cylindrical body having a front end, a back end, and an internal surface forming a central bore,

ii. a retaining surface extending radially outwardly from the body and located intermediate the front and rear ends, the retaining surface retained by a first radially inwardly extending surface of the paint gun housing wall, and

iii. a generally radially outwardly extending resilient flange located at the back end of the body a predetermined distance from the retaining surface,

such that the flange and the retaining surface define a peripheral groove therebetween on an outer surface of the body, and wherein the flange is resiliently deflected by and seals against a second radially inwardly extending surface of the paint gun housing wall when the sealing ring is retained in the paint gun housing.

5,183,208

DRIP IRRIGATION EMITTER

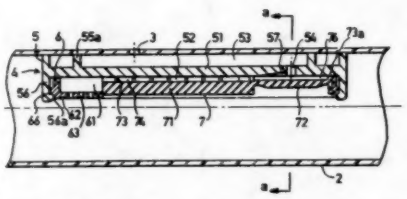
Amir Cohen, Yuvalim, Israel, assignor to Agroteam Consultants Ltd., Haemek, Israel

Filed Jul. 15, 1991, Ser. No. 729,953

Claims priority, application Israel, Jul. 20, 1990, 95138; Oct. 29, 1990, 96164

Int. Cl.[5] B05B *15/00*

U.S. Cl. 239—542 **16 Claims**



1. A drip irrigation emitter comprising:

a housing including an inlet connectible to a source of pressurized water, an outlet for discharging the water from the housing, and a flow-reducer passageway between said inlet and outlet for reducing the flow of water discharged through the outlet;

said flow-reducer passageway including a labyrinth flow path communicating with said inlet, and an outlet control chamber between said labyrinth flow path and said outlet;

and an elastomeric member fixed within the housing and defining, with an internal surface thereof, a deformable wall of at least said outlet control chamber, which outlet control chamber is automatically enlarged or restricted by deformation of the elastomeric member in response to flow through said outlet control chamber;

said elastomeric member being embossed with an integrally formed relief formation on a surface thereof facing said internal surface of the housing to space same from said internal surface and to permit the enlargement or reduction of said outlet control chamber upon the deformation of the elastomeric member in response to said flow.

5,183,209

ASSEMBLY OF AN ELECTROMAGNET CORE OF AN ELECTROMAGNETIC INTERNAL COMBUSTION ENGINE FUEL INJECTOR

Mario Ricco, Bari; Sisto L. De Matthaeis, Modugno, and Domenico Maldera, Corato, all of Italy, assignors to Elasis Sistema Ricerca Fiat Nel Mezzogiorno Societa Consortile per Azioni, Pomigliano d'Arci, Italy

Filed Oct. 28, 1991, Ser. No. 783,563

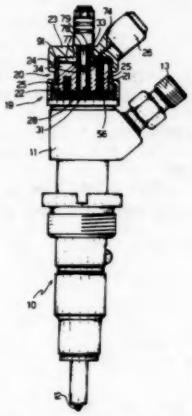
Claims priority, application Italy, Oct. 31, 1990, 53355/90[U]

Int. Cl.[5] B05B *1/30*

U.S. Cl. 239—585.1 **6 Claims**

1. An electromagnetic injector for internal combustion engine fuel injection systems, comprising a hollow body (**11**) with an injection nozzle (**12**); a control valve (**19**) for connecting a control chamber to a drain conduit (**33**) and so opening said nozzle (**12**); an electromagnet (**20**) comprising a magnetic core (**24**); and a skirt (**21**) for securing said core (**24**) to said hollow body (**11**), said skirt (**21**) comprising a first support (**87**) for said core (**24**), and a ring (**91**) pressed on to a cap (**77**);

characterized by the fact that said skirt (21) comprises a second support (90) for said cap (77); elastic means (94) being provided



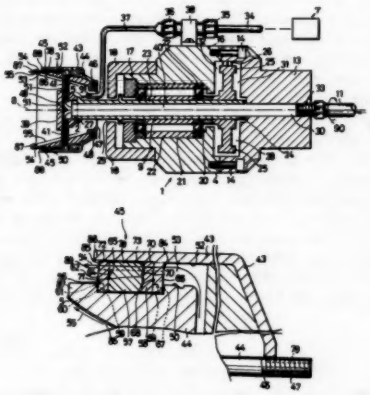
between said cap (77) and said core (24) for pushing said core (24) on to said first support (87).

5,183,210

ELECTROSTATIC SPRAY COATING APPARATUS

Hideo Takeishi, Minoo; Sigeki Houseki, Izumi, and Isao Matsubara, Suita, all of Japan, assignors to Ohgi Paint Trading Co., Ltd., Osaka, Japan

Filed Sep. 24, 1990, Ser. No. 587,950
Claims priority, application Japan, Oct. 12, 1989, 1-265978
Int. Cl.[5] B05B *5/04*
U.S. Cl. 239—703 **7 Claims**



1. A rotary head for an electrostatic spray coating apparatus for ejecting an atomized liquid paint toward an object to be coated with paint, the rotary head comprising:

a rotary member, adapted to rotate about a center axis thereof, for discharging the liquid paint therefrom in the form of an annular thin-film and toward the object during rotation thereof; and

means for ejecting a gas flow for atomizing the liquid paint discharged from said rotary member, said ejecting means including an adjusting means for adjusting the ejected gas flow with respect to the center axis of the rotary member;

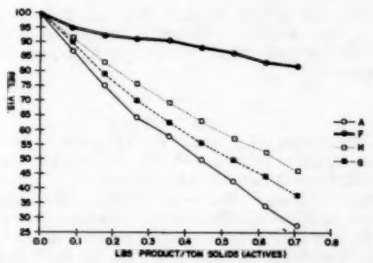
said adjusting means of said ejecting means defining a plurality of elongated gas passages about an outer peripheral surface of said rotary member, each of said gas passages having a first opening for receiving therein a gas supply and a second opening, opposite to the first opening, for discharging the gas flow from the corresponding as passage, the relative positions of the first and second openings of each of the gas passages being changeable in a circumferential direction about said center axis so as to deflect the corresponding gas passage with respect to the longitudinal direction of the center axis of the rotary member.

5,183,211

CHEMICAL AIDS FOR WET-GRINDING PHOSPHATE ROCK

John T. Malito, Oswego, Ill., and Curtis M. Layman, Baton Rouge, La., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Sep. 25, 1991, Ser. No. 765,357
Int. Cl.[5] B02C *23/20*
U.S. Cl. 241—16 **4 Claims**



1. A method for reducing the relative viscosity of a phosphate rock slurry during a grinding process in a phosphoric acid production facility, the method comprising the step of adding during the grinding process an effective amount of a sulfonated polymer having a molecular weight of from 500 to 100,000 and being selected from the group consisting of sulfonated polymers of acrylic acid/acrylamide copolymers and the copolymerization products of acrylic acid, acrylamide and 2-acrylamido-2-methylpropyl sulfonic acid.

5,183,212

METHOD FOR SEPARATING MULTILAYER PLASTICS INTO ITS COMPONENTS

H. Khim Boo, Strongsville; Donald H. Mittendorf, Lorain, and Walter A. Sell, Wakeman, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 21, 1992, Ser. No. 871,781
Int. Cl.[5] B02C *1/00*; C08J *11/00*
U.S. Cl. 241—17 **12 Claims**

1. A method for separating and recovering at least two components of multilayer plastics comprising: dividing the multilayer plastic into small particles, agitating and agglomerating the particles in mixing means whereby like particles agglomerate and adhere to each other, quenching the particles to stop the agglomeration, and separating one type of agglomerated particle from the other type of agglomerated plastic particles.

5,183,213

METHOD FOR RECYCLING WALLBOARD

John S. Knez, Jr., West Linn, Oreg., assignor to Knez Building Materials Company, Tigard, Oreg.

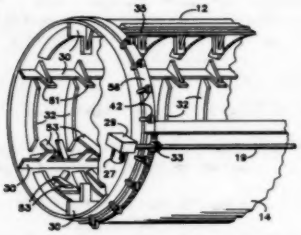
Filed Jul. 30, 1991, Ser. No. 737,997
Int. Cl.[5] B02C *17/04*
U.S. Cl. 241—24 **13 Claims**

1. A method for recycling wallboard wherein the wallboard

comprises gypsum and paper, the method comprising the steps of:

placing the wallboard in a tumbling apparatus having an inner wall;

placing in the tumbling apparatus with the wallboard a plurality of loose removable weights sized so as to be



capable of impacting against said inner wall when said tumbling apparatus is rotated; and

moving said tumbling apparatus for causing the weights to impact against the wallboard as the wallboard contacts said inner wall, thereby to separate the gypsum from the paper.

5,183,214

PROCESS OF MAGNETIC MEDIA MILLING

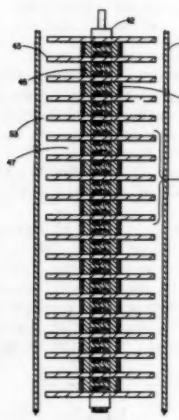
Howard Zakheim, Bala Cynwyd; Peter M. Clinton, Media, both of Pa.; James D. Goldschneider, Newark, Del.; Christopher A. Kasmer, Lawrenceville, N.J.; Markus Zahn, Lexington, Mass., and Charles L. Hoffmeyer, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 549,822, Jul. 9, 1990, Pat. No. 5,022,592, which is a continuation-in-part of Ser. No. 346,877, May 3, 1989, abandoned. This application Apr. 29, 1991, Ser. No. 692,652

The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.

Int. Cl.[5] B02C *17/16*

U.S. Cl. 241—30 **17 Claims**



1. A process of milling a material, comprising passing said material through a media mill within a magnetizable container; agitating the material with a rotatable multi-polar magnetic agitator within the magnetizable container, said agitating comprising subjecting the material to the rotation of a plurality of impellers on a central shaft of the agitator; and grinding said material with a magnetizable media within the container, wherein the media particles are present in such quantity as to provide a media volume of at least about 25% and wherein the media particles are magnetized by at least one of the impellers being a permanent magnet.

5,183,215

GRINDING APPLIANCE

Hermann Getzmann, Biebersteiner Str. 17, 5226 Reichshof-Heienbach, Fed. Rep. of Germany

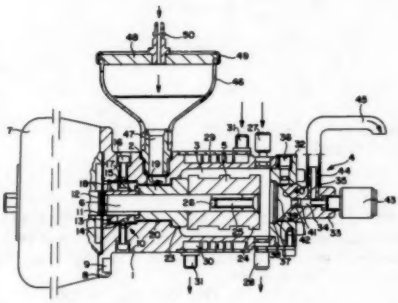
PCT No. PCT/DE88/00695, § 371 Date Jun. 1, 1990, § 102(e) Date Jun. 1, 1990, PCT Pub. No. WO89/05191, PCT Pub. Date Jun. 15, 1989

PCT Filed Nov. 9, 1988, Ser. No. 477,949

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740898

Int. Cl.[5] B02C *17/16*

U.S. Cl. 241—62 **22 Claims**



1. A grinding apparatus adapted for grinding material in the form of flowable or a pasty nonflowable conglomerate material comprising a housing (1), said housing including an inlet through which material which is to be ground is introduced into an inlet chamber (2), a grinding chamber (3) in fluid communication with said inlet chamber (2), a plurality of grinding balls in said grinding chamber (3), an outlet (4) through which ground material exits said outlet (4), an agitator body (5) in said grinding chamber (3) for effecting agitation of said grinding balls, pressure vessel means (46, 51, 56) for housing the material which is to be ground incident to its flow through said housing (1), removable closure means (48, 52, 59) for introducing the material to be ground into said pressure vessel means (46, 56) and closing said pressure vessel means (46, 56), and means (50, 52–55, 57) for pressurizing the material which is to be ground while in said pressure vessel means (46, 51, 56) and while closed by said removable closure means (48, 52, 59) sufficient to press the material to be ground through the inlet and grinding chambers (2, 3, respectively) and into said outlet (4).

5,183,216

DEMOLISHING APPARATUS

Helmut Wack, Am Langen Zaun 7, D-6653, Blieskastel, Fed. Rep. of Germany

Filed Apr. 4, 1991, Ser. No. 680,526

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1990, 4013126

Int. Cl.[5] B02C *1/10*

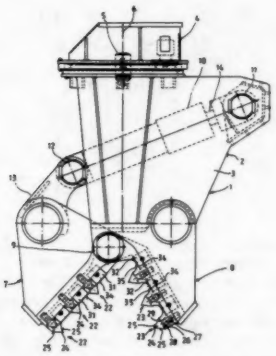
U.S. Cl. 241—101.7 **21 Claims**

1. Demolition apparatus for the demolition and breaking up of concrete, the apparatus comprising:

two shear-like cooperating hydraulically driven jaws, one of said jaws including at least two working ledges and the other of said jaws includes at least three working ledges, said working ledges are all parallel juxtaposed and engage

in one another in an alternating manner in a closed position of the jaws; and

breaking teeth provided on the respective working ledges, wherein the jaw provided with the at least three working ledges includes two outer working ledges with the third working ledge being disposed substantially centrally of the outer working ledges, the two outer working ledges are in a common plane substantially at a right angle to a closing movement of the jaws, with the third working



ledge being set back with respect to the closing movement of the jaws, and

wherein cutting tools are arranged on opposed facing sides of at least two juxtaposed working ledges of the jaws between the breaking teeth, said cutting tools being set back in the direction of the closing movement of the jaws relative to the breaking teeth and being adapted to pass one another in a shearing manner towards the end of the closing movement of the jaws.

5,183,217

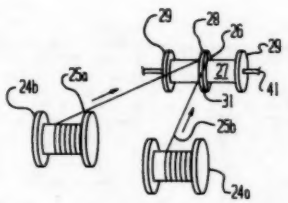
CABLE PACK WINDING AND PAYOUT SYSTEM

Roger A. Holler, Warminster, and Peter R. Ulrich, Perkasie, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1992, Ser. No. 860,839

Int. Cl.[5] B65H *54/00, 55/00, 55/04*

U.S. Cl. 242—47 **3 Claims**



1. A method for forming a cable pack to insure a twist-free payed-out cable comprising the steps of:

a) winding all of the desired length of cable onto a first feed spool;

b) rewinding substantially one half of said length onto a second feed spool thereby creating, at the approximate midpoint thereof, a loop of cable;

c) placing said loop at the longitudinal center of a collapsible take-up mandrel;

d) placing a divider flange around said mandrel atop said loop to divide the mandrel into axially spaced sections and clamp the loop to the mandrel;

e) rotating said mandrel to re-wind cable off of said feed spools onto respective said axially spaced sections of said mandrel to form a two part cable pack; and

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5,183,218

DEVICE FOR THE OPERATION OF HOSES CONTAINING A LIQUID UNDER VERY HIGH PRESSURE

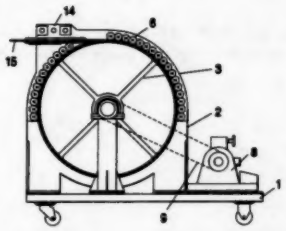
Libero Gavagna, Poggio Renatico, Italy, assignor to MIGEN S.r.l.

Filed Feb. 13, 1991, Ser. No. 654,543

Claims priority, application Italy, Mar. 8, 1990, 19608 A/90

Int. Cl.[5] B65H *23/00, 20/00, 18/00*

U.S. Cl. 242—54.00 R **8 Claims**



1. A device for the operation of at least one hose containing a liquid under very high pressure, in particular for cleaning internal surfaces of tubes of a tube nest, comprising:

a) at least one hose;

b) a rotating drum around which the at least one hose is wound, forming one coil;

c) a belt inserted on each of at least one outer edge of said drum;

d) a container of said drum equipped with a series of contiguous rollers which are in contact with said belt, said belt causing said rollers to rotate, said belt being an elastomeric substance having a thickness assuring contact with said rollers wherein said rollers hold said at least one hose in adherence with an outer surface of said drum, said container having a transverse aperture which permits passage of said at least one hose between an inside and an outside of said container;

e) a moving guide for said at least one hose positioned transversely to said drum, said moving guide moving with transversely reciprocating motion and aiding in winding and unwinding said hose onto and off of said drum; and

f) a motor for driving the drum and for moving the moving guide in a mutually coordinated manner.

5,183,219

COUPLING FOR AXIALLY LOCKING A REEL OF A TAPE CASSETTE AND FOR DRIVING IT WITHOUT BACKLASH

Pierre Abeille, Antony, and Didier Bredif, Kremlin-Bicetre, both of France, assignors to Schlumberger Industries, Mon Trouge, France

Continuation of Ser. No. 434,961, Nov. 6, 1989, abandoned. This application May 22, 1991, Ser. No. 703,716

Claims priority, application France, Nov. 15, 1988, 88 14786

Int. Cl.[5] B65H *16/10, 18/14, 20/38*

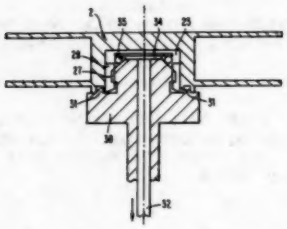
U.S. Cl. 242—68.1 **17 Claims**

1. A coupling for axially locking a reel of a cassette relative to the drive wheel of a magnetic recorder, said drive wheel having an axial abutment against which said reel may bear, said reel being provided with a central recess having at least one rest projecting radially inward, said coupling including:

resilient locking means including a toroidal spring carried by a sloping surface of said drive wheel; and

control means separate from said resilient locking means and

slidably mounted within said drive wheel for tensioning said resilient locking means from a rest position in which



said reel can freely slide onto said drive wheel to a working position in which said reel is locked against said abutment.

5,183,220

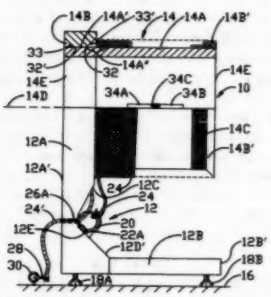
TOW ROPE BOBBIN ASSEMBLY

Arthur A. Cencula, 20772 W. Verona, Lake Villa, Ill. 60046

Continuation of Ser. No. 391,494, Aug. 9, 1989, abandoned. This application Jan. 9, 1991, Ser. No. 639,578

Int. Cl.[5] B65H *75/34*

U.S. Cl. 242—85.1 **3 Claims**



1. A tow rope bobbin assembly, comprising:

a bobbin having a stationary shaft for supportive contact with a coil of rope wrapped therearound; and

a mounting bracket assembly including a bracket body,

means for attached the bracket body to an underlying surface, and

means for cantilever stationary mounting of said bobbin to said bracket body with the stationary shaft of the bobbin substantially parallel to said underlying surface and in spaced relationship therewith; and

means carried by an end of the shaft for releasibly holding the shaft against rotation relative to the bracket body including a hinged part pivotally connected to said bracket body that is moveable between a position in which the shaft is released from said bracket body and another position in which the shaft is not released from the bracket body.

5,183,221

FISHING REEL

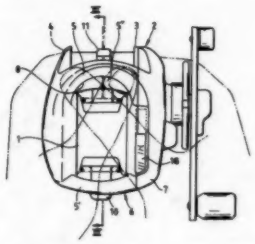
Michiki Kawai, Aichi, and Takeo Miyazaki, Tokyo, both of Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan

Filed Apr. 10, 1991, Ser. No. 683,065

Claims priority, application Japan, Apr. 18, 1990, 2-40662[U]

Int. Cl.[5] A01K *89/00*

U.S. Cl. 242—310 **5 Claims**



1. A fishing reel comprising:

a spool rotatably supported on a reel body;

said reel body comprising leg means for mounting said fishing reel on an elongated fishing rod, said leg means interposed between right and left side frames of said reel body, and a thumb support frame connecting said right and left side frames, wherein said right and left side frames extend substantially parallel to said fishing rod and said thumb support frame extends generally transverse to said fishing rod; and

wherein said thumb support frame is bowed outward from said reel body in a first direction generally extending along said fishing rod for ergonomically receiving a thumb, whereby said fishing reel may be comfortably gripped and operated.

5,183,222

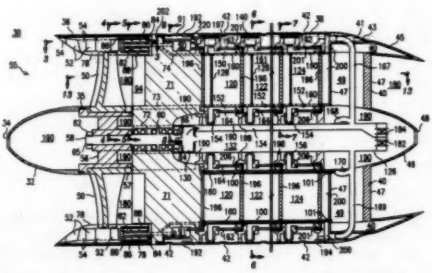
ELECTRIC POWERED TIP-DRIVEN FAN WITH METAL/AIR BATTERY ASSEMBLY THEREFOR

John W. Ramsey, Jr., Wichita Falls, Tex., assignor to Tacticon Corp., Wichita Falls, Tex.

Filed Aug. 12, 1991, Ser. No. 743,783

Int. Cl.[5] F04B *35/04*

U.S. Cl. 244—53 R **16 Claims**



1. An electrically powered fan engine for generating thrust by driving a stream of air which is produced by rotation of a fan, the engine comprising:

an elongate housing having an air inlet at a forward end thereof and an air exhaust at a rearward end thereof, wherein said stream of air passes through said elongate housing,

said fan mounted on a shaft which is located axially within said housing, said fan having a plurality of blades extend-

ing outward from said shaft and said fan positioned proximate a forward portion of said housing,

a cylindrical rotor mounted to said blades of said fan wherein at least a portion of each of said blades is located between said rotor and said shaft,

a cylindrical stator mounted to said housing proximate said air inlet and adjacent to said rotor wherein said rotor and said stator function together as an electric motor to drive said fan rotationally relative to said housing to cause said fan to produce said stream of air and thereby generate said thrust by said engine,

a battery assembly mounted within said housing and having openings therein for receiving and passing through said battery assembly a majority of the air in said stream of air, wherein said stream of air produced by said fan passes sequentially through said battery assembly and through said air exhaust, and

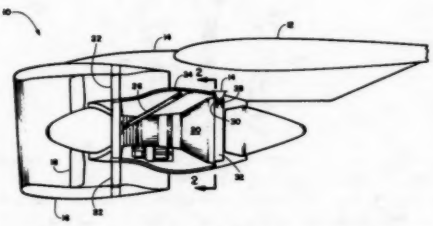
electrical conductors which connect said battery assembly to said electric motor for providing electrical power from said battery assembly to said electric motor.

5,183,223

INTERLOCKING RING FAN JET ENGINE SUPPORT SYSTEM

Dennis Cornax, Chula Vista, Calif., assignor to Rohr, Inc., Chula Vista, Calif.

Filed Jun. 27, 1991, Ser. No. 722,254
Int. Cl.[5] B64D *27/00*
U.S. Cl. 244—54 **2 Claims**



1. A load sharing support system for supporting the engine core of a fan jet gas turbine engine in which the forward end of the core is fixed to the forward part of the engine, which comprises:

a first ring surrounding the aft portion of a fan jet engine and fastened to an engine cowl;

means for securing said first ring to a pylon mounted on an aircraft;

a second ring surrounding and fastened to the aft portion of said engine;

said first ring having a plurality of inwardly extending longitudinal grooves opening inwardly of said first ring; and

said second ring having a plurality of outwardly extending tabs corresponding to said grooves and adapted to mesh with said grooves,

said tabs do not extend entirely into said grooves at ambient temperature, whereby radical thermal expansion as the engine heats up to operating temperature is accomplished by expansion of said tabs further into said grooves,

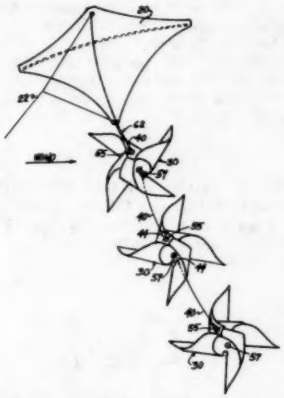
said grooves have sufficient length to permit longitudinal movement of said tabs therealong to accommodate longitudinal thermal expansion of said engine between ambient and operating temperatures.

5,183,224

SELF REGULATING PINWHEEL KITE TAIL

Rudy W. Harburg, 1020 Mapleton Ave., Boulder, Colo. 80304

Filed May 14, 1990, Ser. No. 522,810
Int. Cl.[5] B64C *31/06*; A63H *27/08*
U.S. Cl. 244—155 R **8 Claims**



1. A stabilizing means capable of being attached to a kite said stabilizing means comprising:

a) a swivel means having oppositely disposed windward and leeward ends;

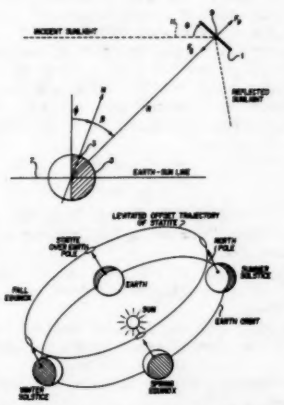
b) a pinwheel having spaced apart windward and leeward faces; wherein the first end of the swivel mechanism is attached by attachment means to said kite, and wherein the second end of the swivel means is attached by attachment means to the windward face of the pinwheel, said swivel means is attached in a manner which allows each stabilizer to trail off in the wind leeward said kite.

5,183,225

STATITE: SPACECRAFT THAT UTILIZES SIGHT PRESSURE AND METHOD OF USE

Robert L. Forward, P.O. Box 2783, Malibu, Calif. 90265

Filed Jan. 9, 1989, Ser. No. 294,788
Int. Cl.[5] B64G *1/36*
U.S. Cl. 244—168 **4 Claims**



1. A method of using a statite wherein said statite comprises an artificial spacecraft maintained adjacent to the earth by

solar light pressure force, and said statite is not in the geostationary orbital arc around the earth, yet remains geosynchronous with respect to the earth, thereby allowing said statite to operate at higher latitudes with respect to the earth, said method comprising the steps of:

launching the Statite from the Earth, without imparting to the Statite a significant centrifugal acceleration, to an altitude where the light pressure on the Statite's solar sail is equal to the force of the Earth's gravity whereby there is no significant effects from centrifugal acceleration with respect to the earth; and

positioning the Statite over the night side of the Earth so the force of the Earth's gravity on the Statite is substantially cancelled by the force resulting from the light pressure acting on the statite.

5,183,226

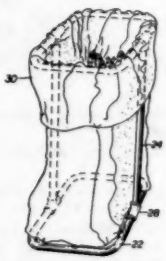
UNIVERSAL COLLAPSIBLE BAG SUPPORT STAND

Russell G. Brooks, 2321 Country Club Dr., Titusville, Fla. 32780

Filed Sep. 23, 1991, Ser. No. 764,243

Int. Cl.[5] A63B *55/04*

U.S. Cl. 248—97 **18 Claims**



1. A foldable, easily stored stand for supporting a thin-walled bag or the like, said stand comprising upper and lower planar members made up of tubular components, said planar members being of substantially equal size and interconnected by a pair of column members, the opposite ends of one of said column members being hingedly connected to a first location on each of said planar members, and the opposite ends of the other of said column members being hingedly connected to a second location on both of said planar members, with said second location on said planar members being at a substantially opposite position on said planar members to said first location, with said planar members thus being held in a substantially parallel, spaced apart relationship by said column members, the substantially equal size of said planar members enabling a user to install a thin-walled bag on either of said planar members that has been placed in an upright position, said hinge connection of said column members to said planar members permitting said planar members to be moved from a spaced apart, parallel relationship, to a compacted condition in which said planar members move toward and approach a coplanar relationship.

5,183,227

SELF-CLOSING BAG HOLDER

Gerald D. Wilhite, Duncanville, Tex., assignor to Jokari/US., Inc., Dallas, Tex.

Filed Jan. 10, 1992, Ser. No. 819,466

Int. Cl.[5] B65B *67/04*

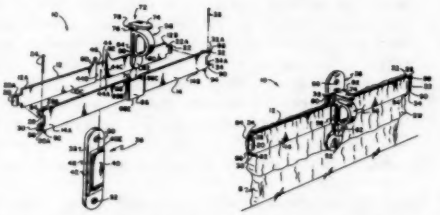
U.S. Cl. 248—99 **15 Claims**

1. Bag holding apparatus comprising, in combination:

a first resilient clamp plate having first and second end portions;

a second resilient clamp plate having first and second end portions;

the first clamp plate being assembled on the second clamp plate with the first end portion of the first clamp plate being coupled to the first end portion of the second clamp plate, and the second end portion of the first clamp plate being coupled to the second end portion of the second clamp plate; the assembly of the first and second clamp plates defining an expandable collar for engaging the tubular sidewall of a flexible bag; and



a mounting bracket assembled on said first clamp plate, said mounting bracket including a base plate adapted for attachment to an external support structure and having a retainer arm attached to said base plate in offset relation therewith, thereby defining an open slot in which said first clamp plate is received.

5,183,228

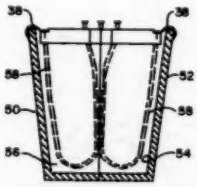
DEVICE FOR COMPARTMENTALIZING A CONTAINER

Shawn Curry, 709 Webster St., New Orleans, La. 70118

Filed Jun. 6, 1991, Ser. No. 711,680

Int. Cl.[5] B65B *67/04*

U.S. Cl. 248—100 **17 Claims**



1. A device for compartmentalizing a container comprising:

an elongated bar having a hollow interior; and

a pair of transverse arms, each secured to opposite sides of a middle portion of the elongated bar at a right angle to a longitudinal axis of the elongated bar, each arm being adapted for a pivotal movement in relation to the elongated bar, said elongated bar and each of said transverse arms being provided with an extension means for extending longitudinal dimensions of said bar and said transverse arms, said extension means comprising an extension member telescopically slidingly engaged within outer open ends of said elongated bar and said transverse arms.

5,183,229

BABY BOTTLE HOLDER

Michael D. Duggan, 92-523 Kokole St., Makakilo, Hi. 96707

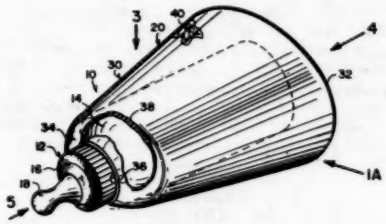
Filed Dec. 12, 1991, Ser. No. 805,633

Int. Cl.[5] A47D *15/00*

U.S. Cl. 248—102 **5 Claims**

1. A holder for a baby bottle of the type having a body, a cap and a nipple, said holder comprising means for retaining the body of the baby bottle, so that the baby bottle will remain stationary, when said retaining means with the baby bottle is placed onto a mattress in a crib or the like near a mouth of a baby, allowing the baby to always have access to the nipple for feeding, said retaining means includes an oval shaped sleeve, not just irregular but specifically oval shaped, with a wide

opened rear end for insertion of the body of the baby bottle therein and a narrow front end having a circular aperture thereabout, so that the cap and nipple of the baby bottle can



extend through said circular aperture, with said oval shaped sleeve preventing the baby bottle from rolling away from the mouth of the baby.

5,183,230

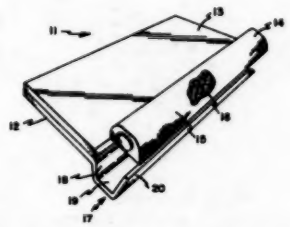
COMPUTER KEYBOARD SUPPORT WITH PADDED WRIST SUPPORT

Wayne E. Walker, Kent, and Grant A. Walker, Federal Way, both of Wash., assignors to Fox Bay Industries, Inc., Kent, Wash.

Continuation of Ser. No. 626,217, Dec. 12, 1990, abandoned. This application Jan. 21, 1992, Ser. No. 824,912

Int. Cl.[5] B43L *15/00*

U.S. Cl. 248—118 **13 Claims**



1. A support for supporting a keyboard on an external surface, said external surface including an edge, said support further supporting a keyboard operator's hands over the keyboard so that a keyboard operator's wrists are supported in a generally nonflexed horizontal position, said support comprising:

a keyboard support portion including a top supporting surface for holding the keyboard in a stationary position relative to said support, said keyboard support portion including a bottom surface for resting on the external surface;

an overhang portion extending from said keyboard support portion along a front edge of said keyboard support portion, said overhang portion having a vertically descending member having an outer surface facing toward the keyboard operator, said outer surface defining a vertical depth extending vertically below said top supporting surface and said bottom surface of said keyboard support portion, said vertically descending member having an inner surface for abutting the edge of the external surface;

a wrist support portion connected to said overhang portion, said wrist support portion having a top surface, said top surface positionable at a height to support the keyboard operator's hands over the keyboard so that the keyboard operator's wrists are supported in a generally nonflexed horizontal position during typing; and

means for adjusting said wrist support portion vertically along said vertical depth defined by said outer surface of said vertically descending member of said overhang portion wherein said wrist support portion is adjustable for keyboards of different vertical heights to permit support of the wrists in the generally nonflexed horizontal position during typing.

5,183,231

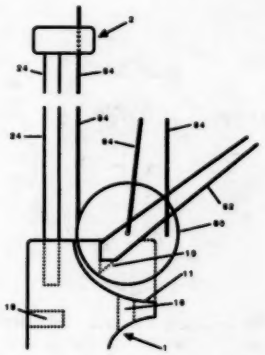
BOW POD OR HOLDER

James A. Pellerin, 2086 Anoka, Flint, Mich. 48532

Continuation of Ser. No. 659,519, Feb. 21, 1991, abandoned. This application Mar. 24, 1992, Ser. No. 857,109

Int. Cl.[5] A47F *7/00*

U.S. Cl. 248—156 **15 Claims**



1. A holder of an archery bow, utilizing a compound bow having a bow-end, an end-pulley, and a bowstring, comprising:

a block having a top, bottom, front side, back side, left side, and right side;

a socket of uniform cross section, upwardly open, adapted to confine the bow-end, placed in said top of said block, and extending from said front side to said back side;

a cavity shaped to receive loosely the end-pulley, placed in said top and said right side of said block between said front side and said back side;

a hook having a gap wider than the bowstring, capable of retaining the bowstring, and facing away from the right side; and

positioning means, communicating with said block and said hook, for positioning said hook above said socket.

5,183,232

INTERLOCKING STRAIN RELIEF SHELF BRACKET

John A. Gale, 3959 Colorado Ave. S., St. Louis Park, Minn. 55416

Filed Jan. 31, 1992, Ser. No. 828,422

Int. Cl.[5] A47K *1/00*

U.S. Cl. 248—220.2 **5 Claims**

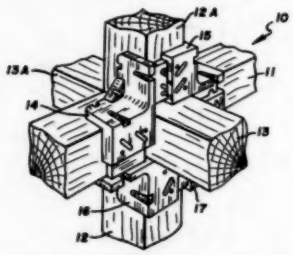
1. Interlocking shelf bracket means for joining individual structural members together in right angular relationship, one to another to form an array of individual members arranged in preselected isotonic and comprising:

(a) a generally "L"-shaped connection member consisting of an angle body and arranged for interlocking mating relationship with a like connection member and including first and second legs, each leg comprising a planar face having an inner edge surface and an outer edge surface, and with a substantially continuous flanged surface extending from the inner edge surface of said planar face of said first leg to form said angle body member and including a common apex formed at the juncture of said first and second legs,

and with said first and second legs extending at right angles from said common apex;

(b) a generally rectangularly configured "U"-shaped channel opening formed on the planar face of said first leg and extending inwardly from the outer edge surface of the flange of said first leg and having an interior surface defining said rectangularly shaped opening and with opposed interior end surfaces further defining said rectangularly shaped opening;

(c) a generally rectangularly shaped interlocking tabular projection for mating engagement within said rectangularly shaped opening and extending outwardly from the outer edge of the said planar face of said second leg and having an exterior surface with opposed edges defining said rectangular shaped tabular projection to mate with and engage the interior surfaces of said rectangularly shaped opening;



(d) means disposed along the surfaces of said fist and second legs for receiving and accommodating fasteners for securing said "L"-shaped connection member to individual structural members for interconnection thereof, with at least one of said fastener-accommodating means in each of said legs being in the form of an elongated slot, and with the slot axis being arranged obliquely to the axis of said first and second legs; and

(e) the arrangement being such that said "U"-shaped channel and said tabular projection mesh and interlock to form a stable interconnection between the interior surfaces of said rectangularly shaped opening and the profile of said rectangularly shaped tabular projection respectively are in mutually abutting relationship with the structural members to which they are secured.

5,183,233

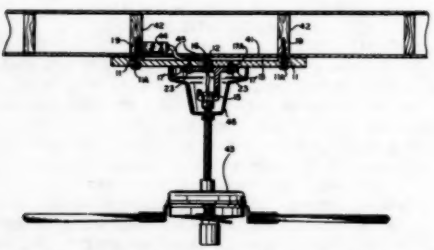
UNIVERSAL FIXTURE SUPPORT

Joseph LaPalomento, 1221 Dennis St., Angleton, Tex.

Filed May 10, 1991, Ser. No. 698,136

Int. Cl.[5] B42F *13/00*

U.S. Cl. 248—343 **11 Claims**



1. A universal electrical fixture hanging system for suspending an electrical fixture from a flat surface having a grid comprising in combination:

a flat panel having a series of apertures to receive fasteners therein and shaped to be attached to said grid;

said panel having a central opening through which wires from an electrical source pass and a slot on its rear said passing through said central opening;

said slot being adapted to receive a wire to allow placement of said panel flush with said flat surface;

a support means for said fixture detachably mounted to said panel over said central opening for supporting said fixture,

said support means having an opening aligned with said central opening on said panel and a hook element for supporting said fixture to permit attachment of wires from said fixture to the wires from said electrical source.

5,183,234

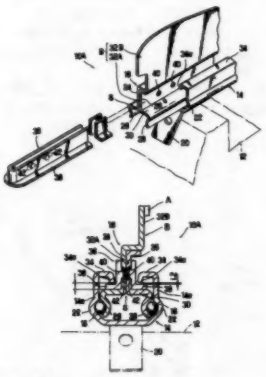
SEAT SLIDE DEVICE

Seishiro Saito, Akishima, Japan, assignor to Tachi-S Co., Ltd., Akishima, Japan

Filed Nov. 19, 1991, Ser. No. 794,385

Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—430 **6 Claims**



1. A seat slide device comprising:

a lower rail having a generally U-shaped configuration in section, which is opened at its upper part, forming thus an upper opened part and also forming two spaced-apart upper flange portions;

an upper rail including a slide portion which is fitted in said lower rail in a slidable manner, and a bracket portion which is integrally formed with said slide portion, such that said bracket portion is disposed at the center of said slide portion and extends upwardly through the upper opened part of said lower rail, said slide portion having a horizontal part formed integrally with said bracket portion and having a pair of lateral parts formed downwardly from both ends of said horizontal part;

a ball retaining portion which is defined between a lateral wall of said lower rail and one of said lateral parts of said upper rail slide portion, said ball retaining portion being adapted for retaining at least one steel ball therein; and

a spacer member made of a soft, elastic material, said spacer member being interposed between said upper flange portions of said lower rail and said horizontal part of said upper rail slide portion,

wherein said upper rail is prevented by said spacer member against vertical wobbling within said lower rail;

wherein said spacer member is of such a formation as to be affixed over both of said horizontal part of said slide portion and bracket portion associated with said upper rail, and wherein said spacer member is formed generally in U-shaped configuration having a peripheral horizontal part and a vertical part standing therefrom, and wherein

said spacer member is secured to said upper rail such that said peripheral horizontal part lies on said horizontal part of said upper rail slide portion while said vertical part sandwiches therein said bracket portion of said upper rail.

5,183,235

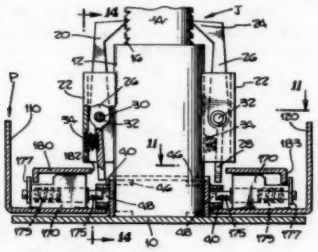
APPARATUS FOR ALIGNING AND RELEASING A TWO-PART JACK SYSTEM

Harry H. Arzouman, Corona Del Mar, and Clyde E. Slay, Santa Ana, both of Calif., assignors to Safe-T-Jack, Inc., Huntington Beach, Calif.

Division of Ser. No. 350,111, May 9, 1989, Pat. No. 4,960,264. This application Sep. 28, 1990, Ser. No. 590,080

Int. Cl.[5] B66F *5/04*

U.S. Cl. 254—8 B **1 Claim**



1. In a two-part jack system, a jack stand comprising:

a hollow elongated lower frame member having a supporting base attached to its lowermost end;

an elongated upper frame member extending in telescoping relation within said lower frame member;

releasable ratchet means for supporting said upper frame member in a selected position of upward extension, including a pair of downwardly extending pawl arms disposed on opposite sides of said upper frame member and each having its lowermost portion forming a ratchet release arm;

means for easily aligning a separate power unit to the jack stand in precise relation thereto, when approached from either direction, including

a pair of generally parallel, horizontally extending side rails attached to opposite sides of said lower frame member, each of said side rails having a vertical outer surface;

said side rails having both ends of their vertical outer surfaces tapered towards each other to provide alignment ramps;

each of said side rails also having an outwardly opening horizontal alignment hole at the longitudinal center of its vertical outer surface; and

said ratchet release arms being in a common vertical plane with said alignment holes.

5,183,236

LOCKING DEVICE FOR RECTILINEAR OR CIRCULAR DISPLACEMENT MECHANICAL JACKS

Georges Droulon, Flers, France, assignor to ETS. Cousin Freres, Flers, France

Filed Sep. 21, 1990, Ser. No. 586,433

Claims priority, application France, Sep. 21, 1989, 89 12406

Int. Cl.[5] B66F *3/02*

U.S. Cl. 254—95 **11 Claims**

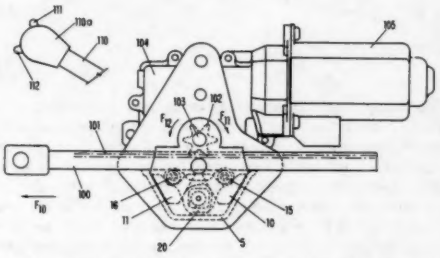
1. A locking device for rectilinear or circular displacement mechanical jacks, comprising:

at least one rod;

notched roller means for locking said rod in a locked position thereof;

at least one V-shaped bearing plate having toothed ramps for cooperating with said notched roller means;

a rotatable cam for selectively bearing against said at least one bearing plate to effect said locked position of said rod,



and releasing said at least one bearing plate and hence said notched roller means to free said rod;

means to rotate said cam; and

control means to drive said means for rotating said cam.

5,183,237

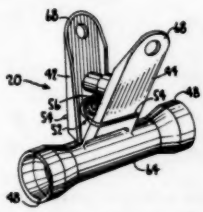
METHOD FOR FISHING LINES IN SERIAL CONDUITS

Ronald P. Drago, Easton, Pa., assignor to Spectrum Innovations, Inc., Flemington, N.J.

Filed Dec. 23, 1991, Ser. No. 813,894

Int. Cl.[5] B65H *59/00*

U.S. Cl. 254—134.4 **7 Claims**



1. A method for fishing at least one line through serial hollow conduits having ends terminating in at least one wall of a housing having internal dimensions larger than that of the conduits, such that the housing defines a discontinuity in said internal dimensions at the housing, comprising the steps of:

attaching to an end of a first conduit and an end of a second conduit a substantially airtight bridging section having an internal contour leading smoothly from the end of said first conduit to the end of said second conduit end, thereby to define a route passing serially through the conduits and through the bridging section therebetween, the bridging section including means which are openable along a full length of the bridging section;

attaching a plug to an end of said line;

forcing said plug pneumatically through the route including the bridging section by application of differential pressure to the first and second conduits, whereby said line extends along the route, the bridging section guiding the plug and pneumatically closing the route through the conduits;

opening the bridging section by operating the means openable along said full length; and,

removing the bridging section to access said line.

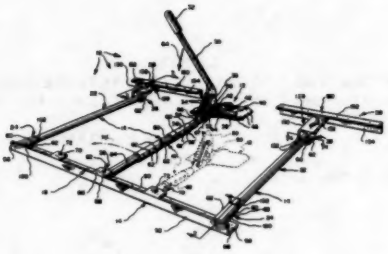
5,183,238

CARPET STRETCHING APPARATUS PARTICULARLY FOR LONG LENGTHS OF CARPET

Brad Sorensen, 255 W. 200 North, Vernal, Utah 84078

Filed Jan. 4, 1991, Ser. No. 638,461
Int. Cl.[5] B65H 77/00
U.S. Cl. 254—209 2 Claims

1. An apparatus for stretching carpet taut across a floor of an entire room from a single general location independent of the dimensions of the floor comprising a spikeless frame comprising a base which only rests upon, but does not otherwise engage the carpet, the frame further comprising two broad hooks for engaging a back edge of a tack strip secured to the floor near a wall of the room, two side members, one broad hook being attached to each side member, each side member comprising an underside comprising part of said base, a cross member connected to the two side members at respective locations remote from the broad hooks, the cross member comprising at least one carpet stretcher connection site, the spikeless frame defining a large unobstructed area between the side members and the cross members and the tack strip;



a carpet stretcher comprising a spiked stretching head for spike engagement and applying stretching force to a plurality of specific carpet locations within the unobstructed area without relocation of the frame and a support member spanning between the stretching head and the connection site in a plane generally parallel to the carpet by which each stretching force is transferred to the frame and thence through the hooks to the tack strip;

the attachment between each side member and one of the associated hooks comprising selectable connection sites to allow adjustment for variations in carpet pile height.

5,183,239

Patent Not Issued For This Number

5,183,240

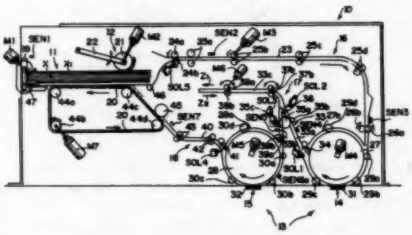
AUTOMATIC DOCUMENT FEEDER

Toru Morooka, Yamato-Koriyama, and Yuji Okamoto, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 23, 1991, Ser. No. 764,199
Claims priority, application Japan, Sep. 28, 1990, 2-262644; Feb. 22, 1991, 3-28693; Sep. 4, 1991, 3-224109
Int. Cl.[5] B65H 5/22
U.S. Cl. 271—3.1 9 Claims

1. An automatic recycling document feeder for automatically feeding a plurality of document sheets to an exposure position from a tray and returning said document sheets to said tray after exposure, comprising;

a sensor, provided near a transit path of supplied document sheets, for detecting a presence of a document sheet at a position where said sensor is located;



means for obtaining one continuous time of presence of the document sheet according to detection output from said sensor;

detecting means for detecting an occurrence of a multiple feed when said continuous time of presence of a document sheet obtained this time is longer than a continuous time of presence of a document sheet obtained last time;

and means for idly transferring the document sheets from the tray instead of normal feeding for exposure until the document sheet just before the document sheets involved in the multiple feed is transferred from the tray, when said detecting means detects the occurrence of the multiple feed.

5,183,241

SHEET FEEDING DEVICE FOR INVERTING A SHEET

Nobuyuki Torisawa, Minamiashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 29, 1991, Ser. No. 800,107
Claims priority, application Japan, Nov. 29, 1990, 2-331954
Int. Cl.[5] B65H 5/00, 29/00
U.S. Cl. 271—12 8 Claims

1. A device for feeding sheets one by one, comprising:

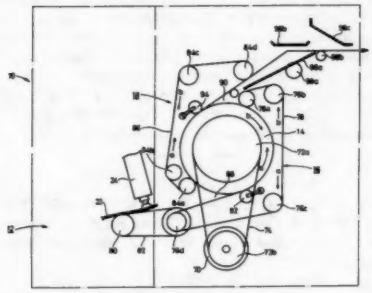
a suction pad movable towards stacked sheets so as to attract an uppermost sheet thereto;

a drum rotatable in both forward and reverse directions;

a means for rotating said drum in said forward and reverse directions;

means for changing the rotation of said drum from said forward direction to said reverse direction when said uppermost sheet has reached a predetermined position in said device;

a first belt-type conveying system disposed on one part of the surface of said drum;
a second belt-type conveying system disposed on another part of the surface of said drum;
a sheet insertion port defined by said drum and said first belt-type conveying system; and
a sheet withdrawal port defined by said drum and said second belt-type conveying system;



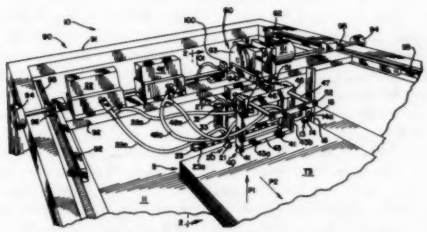
the arrangement being such that said suction pad is displaced to face said sheet insertion port so as to interpose said uppermost sheet between said drum and said first belt-type conveying system, followed by a transfer toward said second belt-type conveying system and a subsequent discharge of said uppermost sheet in a reversed position from said sheet withdrawal port upon reverse rotation of said drum by said rotating means in response to said means for changing the rotation.

5,183,242

METHOD AND APPARATUS FOR FEEDING SHEETS

Robert A. Crimmins, Algonquin, and Michael D. Flasza, Schaumburg, both of Ill., assignors to D&K Custom Machine Design, Inc., Elk Grove Village, Ill.

Filed Aug. 30, 1991, Ser. No. 752,395
Int. Cl.[5] B65H *5/08*
U.S. Cl. 271—14 **24 Claims**



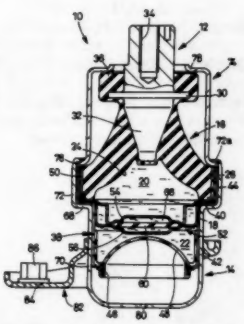
1. A sheet feeding mechanism comprising:
A) a platform for supporting a stack of sheets with an exposed top sheet;
B) a first suction cup having first vacuum means for holding said top sheet and being movable along a generally vertical path between a first position and a second position in a first direction holding said top sheet and in a second direction without holding said top sheet;
C) first switch means for turning said first vacuum means ON and OFF, said top sheet being held when said first vacuum means is ON;
D) first guide means for supporting and moving said first suction cup along said generally vertical path,
said first guide means includes
means for driving a fluid cylinder and
a generally vertical piston rod connected adjacent one end to said first suction cup and cooperating at said opposite end with said fluid cylinder,
said first suction cup being in said first position when said piston rod is extended from said fluid cylinder and
said first suction cup being in said second position when said piston rod is retracted into said fluid cylinder;
E) a second suction cup having second vacuum means and being movable along a generally horizontal path between a third position and a fourth position in a first direction holding said top sheet and in a second direction without holding said top sheet;
F) second switch means for turning said second vacuum means ON and OFF, said top sheet being held when said second vacuum means is ON; and,
G) second guide means for supporting and moving said second suction cup along said generally horizontal path,
said second guide means includes
means for driving a rotating member,
a link pivotally interconnected adjacent one end to said rotating member defining a rotating member-link interconnection,
a generally horizontal stationary guide rod and
a reciprocating block slidable on said guide rod pivotally interconnected to said link adjacent the other end of said link,
said second suction cup being in said third position when the distance between said rotating member-link interconnection and said guide rod is the greatest and
said second suction cup being in said fourth position when said distance between said rotating member-link interconnection and said guide rod is the smallest.

5,183,243

FLUID-FILLED ELASTIC MOUNT HAVING CAULKED PORTION FOR SEALING OFF FLUID CHAMBER

Nobuo Matsumoto, Nagoya, Japan, assignor to Tokai Rubber Industries, Ltd., Japan

Filed Jun. 6, 1991, Ser. No. 711,996
Claims priority, application Japan, Jun. 12, 1990, 2-153375
Int. Cl.[5] F16M *1/00*
U.S. Cl. 267—140.13 **9 Claims**



1. A fluid-filled elastic mount for flexibly connecting two members, comprising:
a first support member fixed to one of the two members to be flexibly connected;
an elastic body having a generally truncated conical shape and including a small-diameter end portion and a large-diameter end portion, said first support member being secured to said small-diameter end portion of said elastic body;
a cylindrical connecting member secured to an outer cir-

cumferential surface of said large-diameter end portion of said elastic body;

a closure member having a generally cylindrical shape, and including a first and a second cylindrical wall portion, said first cylindrical wall portion being fitted on said connecting member such that an opening of said second cylindrical wall portion is fluid-tightly closed by said elastic body, said second cylindrical wall portion cooperating with at least said elastic body to define a fluid chamber filled with a non-compressible fluid;

a flexible diaphragm secured to said second cylindrical wall portion of said closure member so as to partially define said fluid chamber;

a sealing rubber layer which is formed on at least one of an outer circumferential surface of said connecting member, and an inner circumferential surface of said first cylindrical wall portion of said closure member, such that said sealing rubber layer is sandwiched between said connecting member and said closure member in a direction perpendicular to a load-receiving direction in which vibrations are applied to the elastic mount;

a second support member which is spaced apart from said first support member in said load-receiving direction, and fixed to the other of said two members to be flexibly connected, said second support member being fitted on said closure member and including a caulked portion which retains said connecting member and said first cylindrical wall portion of said closure member in said load-receiving direction;

a partition structure supported by said closure member so as to extend in a direction substantially perpendicular to said load-receiving direction, said partition structure dividing said fluid chamber into a pressure-receiving chamber partially defined by said elastic body so that a pressure of the fluid in said pressure-receiving chamber changes due to elastic deformation of said elastic body upon application of the vibrations in said load-receiving direction, and an equilibrium chamber partially defined by said second cylindrical wall portion and said flexible diaphragm so that a volumetric change in said equilibrium chamber is allowed by elastic deformation of said flexible diaphragm; and

means for defining an orifice passage for fluid communication between said pressure-receiving and equilibrium chambers.

5,183,244

BLADE ASSEMBLING

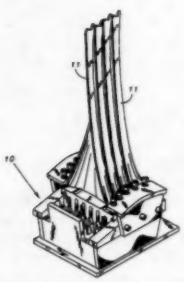
Ralph J. Ortolano, Rancho Palos Verdes; Kenneth A. Ball, Huntington Beach, and Gary Bowman, Riverside, all of Calif., assignors to Southern California Edison, Rosemead, Calif.

Continuation-in-part of Ser. No. 483,129, Feb. 2, 1990, Pat. No. 5,026,032. This application Feb. 13, 1991, Ser. No. 654,495

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[5] B23P *19/04*

U.S. Cl. 269—43 **12 Claims**



1. A pre-assembly verification tool for temporarily locating a predetermined number of blades of a rotor in relative operative adjacent relationship with each other comprising a support, spaced sidewalls affixed to the support, the support and sidewalls forming a space for locating roots of respective blades in adjacent abutting relationship, the spaced sidewalls being separated to accommodate the thickness of the roots so that the roots may be located snugly between the sidewalls, a portion of the sidewalls having an arc of curvature representative of an arc of curvature for a rotor for temporarily accommodating the blades such that when the blades are temporarily located with the roots in the space, the blades adopt a temporary location relative to each other representative of a permanent blade position in the rotor, wherein the arc of curvature forms a regular smooth uninterrupted curved surface, and means for holding the roots temporarily in the space, and wherein the holding means is operative outside a plane of the arc of curvature of the surface of the sidewall.

5,183,245

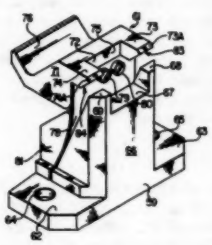
SEMI-CONDUCTOR WAFER RETENTION CLIP

Antonio DiNapoli; Gerald L. Goff, and Roger A. Sikes, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 21, 1990, Ser. No. 617,008

Int. Cl.[5] B25B *1/00*

U.S. Cl. 269—254 R **3 Claims**



1. An improved semi-conductor wafer retention clip of the type having a resiliently supported, forwardly projecting clip head with a bottom side, the bottom side having a forwardly and upwardly sloping first front surface portion having a first front-to-rear width and being adapted to overlie and releasably engage a peripheral edge portion of a semi-conductor wafer to facilitate the retention of the wafer on an underlying treatment surface of a processing pedestal, said clip head further having a top side with a forwardly and downwardly sloping second front surface portion having a second front-to-rear width and forming with the sloping first front surface portion a leading edge portion of the clip head, wherein the improvement comprises:

a relatively wide notch centrally disposed in the clip head and extending rearwardly through the leading edge thereof, said notch forming on the clip head a pair of relatively narrow, forwardly projecting tines disposed on opposite sides of the notch and adapted to overlie and releasably engage spaced apart peripheral edge portions of the supported wafer,

the presence of the notch, the relative narrowness of the tines, and the resultant substantially reduced contact area between the clip head and the supported wafer combining to reduce both the available contaminant receiving area of the clip and the amount of contaminant matter transferred from the clip to the supported wafer; and

a relative configuring and angular orientation of said first and second sloping front surface portions of the clip resulting in the first front-to-rear sloping surface widths on the tines being at least several times greater than their second front-to-rear sloping surface widths, and the leading edge portions of the tines being, elevationally, at least

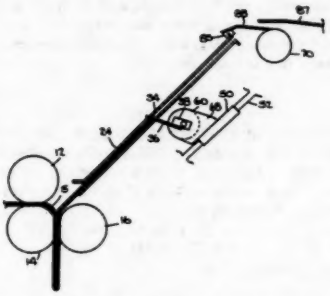
several times closer to the uppermost top side surfaces of the tines than to the lowermost bottom side surfaces thereof.

5,183,246

DIVERTING APPARATUS AND METHOD FOR IN-LINE INSERTING EQUIPMENT

Robert J. Edwards, Ridgefield, and Harry E. Luperti, Bethel, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 21, 1991, Ser. No. 781,050
Int. Cl.[5] B42C *1/00*; B31F *1/00*
U.S. Cl. 270—45 **12 Claims**



1. A method of diverting one of more sheets from a first paper path, comprising the steps of:

a) providing a buckle chute folder having a pair of fold rollers and at least one buckle chute having an inlet and an outlet;

b) pivotally mounting stop fingers to said buckle chute and coupling said stop fingers to a solenoid;

c) pivoting said stop fingers to extend through slots in said buckle chute to initiate a fold in the sheets conveyed into said inlet along a first paper path causing the sheets to buckle into a nip of said fold rollers which convey the sheets along the first paper path for further processing;

d) providing a second paper path that is an alternate to the first paper path for conveying only unfolded sheets that are diverted from said first paper path;

e) pivoting said stop fingers out of said slots in said buckle chute to divert the sheets through said outlet which begins said second paper path; and

f) feeding said sheets to said inlet of said buckle chute by a pair of feed rollers.

4. Apparatus for diverting individual sheets from a first paper path, comprising:

a buckle chute folder comprising:

at least one buckle chute, having an inlet which is part of a first paper path and an outlet which begins a second paper path that is an alternate path to said first paper path;

a pair of folding rollers adjacent to said buckle chute, said folding rollers being part of said first paper path;

means for conveying one or more sheets along said first paper path into said inlet of said buckle chute; and

a stop member assembly operatively coupled to said buckle chute, said stop member assembly including at least one stop finger coupled to a solenoid for moving said stop finger between a fold position and a divert position in said buckle chute;

said stop finger being in said fold position to deflect the leading edge of the sheets causing the sheets to buckle into the nip of said folding rollers, said folding rollers conveying said sheets downstream for further processing along said first paper path; and

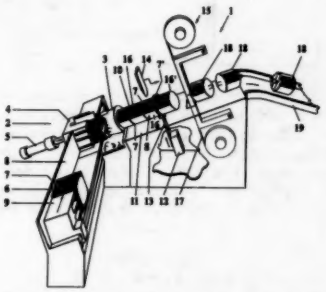
said stop finger being in said divert position to divert said sheets from said first paper path to said second paper path, said second paper path being used only to convey unfolded sheets diverted from said first paper path.

5,183,247

METHOD OF, AND APPARATUS FOR, DETECTING THE POSITION OF A MARKING OR SEPARATING ELEMENT IN A STACK OF SUBSTANTIALLY FLAT PRODUCTS

Hans Blumer, Boppelserstrasse, CH-8112 Otelfingen, Switzerland

Filed Oct. 18, 1991, Ser. No. 779,375
Claims priority, application Switzerland, Oct. 25, 1990, 3414/90
Int. Cl.[5] B65H *33/10, 33/06*
U.S. Cl. 270—95 **18 Claims**



1. A method of detecting the position of a marking or separating element in a stack of substantially flat product by employing a detector arrangement comprising the steps of:

moving the detector arrangement along the stack from an original starting position; and

detecting the presence of a marking or separating element in the stack during said step of moving the detector arrangement.

11. An apparatus for detecting the position of a marking or separating element in a stack of substantially flat products comprising:

a detector arrangement;

means for moving said detector arrangement from a starting position and along the stack of substantially flat products; and

said detector arrangement detecting during travel motion thereof along the stack the presence of a marking or separating element in the stack.

5,183,248

SHEET FEEDING DEVICE

Hiromi Okada, Nara, and Masao Otsuka, Ashiya, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 570,600, Aug. 21, 1990, abandoned. This application May 21, 1992, Ser. No. 886,606
Claims priority, application Japan, Aug. 28, 1989, 1-222674
Int. Cl.[5] B65H *1/08*
U.S. Cl. 271—127 **11 Claims**

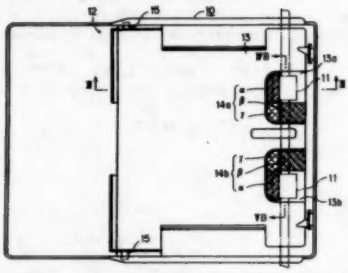
1. A sheet feeding device in which a plurality of sheets can be contained and from which the sheets can be fed one by one by at least two feed rollers when the sheet feeding device is mounted on an apparatus, comprising:

a sheet containing section for containing the sheets;

a mounting means for mounting the sheets arranged in said sheet containing section, wherein at least a forward portion of said mounting means in the direction in which sheets are fed is movable up and down, and wherein a facing position of the forward portion of said mounting means comes into direct contact with the each feed rollers when no sheets are contained in said containing section;

an urging means for urging said mounting means upward at least when the sheets are fed, such that the sheets are brought into contact with the each feed rollers; and

a non-slip means arranged on an upper surface of the forward portion of said mounting means, wherein said non-slip means is in contact with a last sheet mounted on said



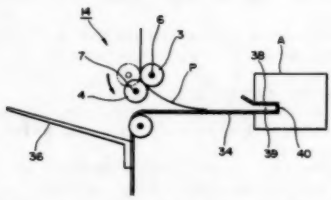
mounting means, had said non-slip means including a base portion which locates forward or backward of the two feed rollers in the sheets feeding direction and a facing portion facing to the roller axis aside the two rollers and being arranged in such a position that it does not come into direct contact with said two feed rollers even when no sheets are contained in said sheet containing section.

5,183,249

PAPER CONVEYOR

Kiyomichi Ichikawa, Tokyo, Japan, assignor to Auto-Stamp Institute Inc., Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 575,072
Claims priority, application Japan, Dec. 12, 1989, 1-322062
Int. Cl.[5] B65H *29/58*
U.S. Cl. 271—186 **7 Claims**



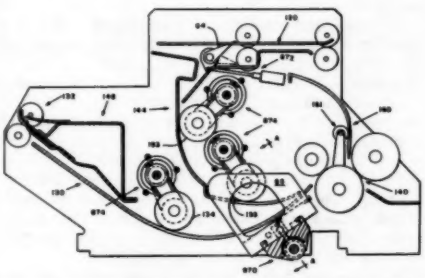
1. A paper conveyor comprising conveyor rolls for conveying paper, drive means for driving and rotating the conveyor rolls, follower rolls which are pressed onto the conveyor rolls and hold paper to be conveyed between themselves and the conveyor rolls to thereby convey the paper in a predetermined direction, and a switch mechanism for switching the direction in which the paper is conveyed from one direction to another, the conveyor rolls, the follower rolls, the drive means and the switch mechanism being operatively connected to each other, wherein the switch mechanism is adapted to control the follower rolls so that the follower rolls can be rocked from one direction to another with their axis of rocking coinciding with an axis of the conveyor rolls, whereby enabling change of the direction in which paper is conveyed by means of the conveyor rolls and the follower rolls, further comprising a base frame comprising first and second side frame plates, a rocking frame comprising first and second side plates, a driving shaft, a follower shaft, at least four bearing portions, first and second pulleys, a driving force transmission belt and a driving motor having a shaft, wherein the first side frame plate of the base frame and the first side plate of the rocking frame are arranged adjacent and parallel to each other, and the second side frame plate and the second side plate are arranged adjacent and parallel to each other, and wherein the conveyor rolls and the follower rolls are mounted on the driving shaft and the follower shaft, respectively, the driving shaft and the follower shaft each have a bearing portion on each end thereof and are supported by the first and second side plates of the rocking frame through the respective bearing portions so that the driving shaft and the follower shaft are parallel to and at a predetermined distance from each other, the follower rolls are capable of contacting the corresponding conveyor rolls during conveyance operation, the driving shaft is also supported by the first and second side frame plates of the base frame through the respective bearing portions, the driving motor is attached to the first side frame plate, with the shaft of the driving motor extending through the first side plate, the first pulley is fixed to one end of the driving shaft which is supported by the first side frame plate and by the first side plate of the rocking frame and the second pulley is fixed to one end of the shaft of the driving motor, and the two pulleys are operatively connected through the driving force transmission belt.

5,183,250

MECHANISM AND METHOD FOR LATERALLY ALIGNING AN ACCUMULATION OF SHEETS

Carl A. Miller, Fairfield; Morton Silverberg, Westport, and Steven A. Supron, Norwalk, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 12, 1990, Ser. No. 491,887
Int. Cl.[5] B65H *31/34*
U.S. Cl. 271—222 **5 Claims**



1. An alignment mechanism for simultaneously aligning a plurality of sheets in an accumulation of sheets, comprising:

a) a pair of lateral guides;

b) a guide for supporting said accumulation between said lateral guides;

c) a cam and cam follower mechanism connected to said lateral guides for moving said lateral guides inwards to laterally align said accumulation in a single operation; wherein,

d) said cam follower mechanism includes a resilient coupling and said alignment mechanism includes an adjustable stop for limiting the travel of said lateral guides, whereby the movement of said lateral guides may be adjusted to accommodate a plurality of widths of said sheets.

5,183,251

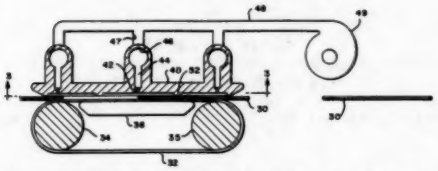
CONVEYOR SYSTEM AND FEEDING SHEETS

Louis M. Sardella, 19 Pickburn Ct., Hunt Valley, Md. 21030

Continuation-in-part of Ser. No. 257,063, Oct. 13, 1988. This application Jul. 5, 1990, Ser. No. 548,252
Int. Cl.[5] B65H *5/02, 5/06*
U.S. Cl. 271—276 **3 Claims**

1. A conveyor system for feeding corrugated blanks in a corrugated box-making machine, the system comprising in combination: conveyor means for transporting the blank along

a predetermined path and including a member for holding and moving a blank, means for directing fluid at positive pressure on a side of the blank opposite said member to urge the blank on the member during transport and means for distributing the fluid over substantial surface portions of the blank on said one side thereof to maintain continuous fluid pressure urging the blank on the member and wherein said means for directing



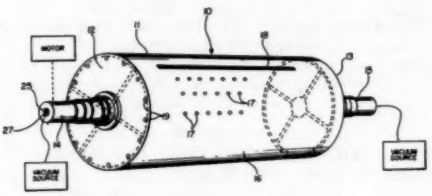
fluid pressure includes a head having orifices for discharging fluid and said means for distributing said fluid pressure includes a plurality of chambers in the head respectively communicating with said orifices while being in close but spaced relationship with the blank such that a fluid film is established between the head and the blank to maintain spacing between said head and the blank.

5,183,252

VACCUM DRUM FOR DIFFERENT SIZED MEDIA

Jack Wolber, Merrimack, N.H.; Steve Lord, Tewksbury, and Dieter Froehling, Burlington, both of Mass., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 332,121, Mar. 31, 1989, abandoned.
This application Apr. 25, 1991, Ser. No. 692,817
Int. Cl.[5] B65H *5/02*
U.S. Cl. 271—276 **20 Claims**



1. A vacuum drum for securing and retaining different sized sheets of flexible media thereon, comprising:

an elongated tubular sleeve member having a hollow interior, a cylindrical wall with an outer surface, a first set of elongated evacuation bores extending longitudinally partway in said wall internally adjacent to said surface, a second set of elongated evacuation bores extending longitudinally partway in said wall internally adjacent to said surface in respective unconnected coaxial relationships to said first set bores, and a multiplicity of holes respectively arranged to place said first and second sets of bores in evacuation communication with first and second zones on said surface;

shaft means, having first and second evacuation ports, for mounting said elongated member for axial rotation; and

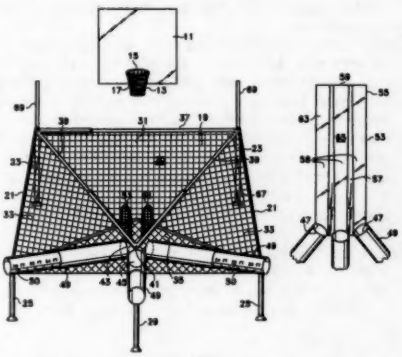
channel means for separately communicating said first and second sets of bores, externally of said member, respectively with said first and second ports; so that connection of said first port to a vacuum source will evacuate said holes of said first zone on said surface, with no evacuation within said sleeve member interior; and connection of said second port to a vacuum source will evacuate said holes of said second zone, with no evacuation within said sleeve member interior; the selective evacuation of said holes of said first and second zones serving to accommodate said different sized sheets.

5,183,253

BASKETBALL RETRIEVAL AND RETURN DEVICE

Anthony J. Grimaldi, 25 Mountain View Ave., Kingston, N.Y. 12401, and Anthony J. Grimaldi, Jr., 6 Holly Blvd., Scotia, N.Y. 12302

Filed Dec. 27, 1990, Ser. No. 634,597
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—1.5 A **2 Claims**



1. A basketball retrieval and return device for use with a conventional basketball goal including a backboard with a base and a basket, the backboard having a side behind the basket, and conventional basketballs, the device comprising:

a retriever in the shape of a funnel having a front, rear and side walls defining an enlarged upward opening, the rear and side walls being inclined downwardly and inwardly to a plurality of downward openings at the front wall, each downward opening being circular and having a diameter which is greater than the diameter of the conventional basketballs, the retriever being located beneath the basket and backboard;

a frame connected to the retriever to support the retriever, such frame including a pair of rear vertical supports, such frame extending vertically above the rear walls of the retriever and

a back net affixed to the rear vertical supports, the back net being extended vertically above the rear wall of the retriever and above the base of the backboard and behind the backboard;

a plurality of ball return conveyers, each ball return conveyer being connected to one of the downward openings, the plurality of ball return conveyers being located at an angle to one another; and

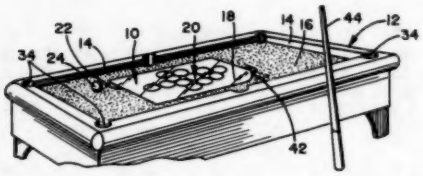
means to direct randomly the basketballs to each of the plurality of downward openings, said means including a flat base plate having an upper and a lower end, the upper end being raised above the lower end and a plurality of partitions vertically located at right angles to the base plate and equally spaced from one another to form channels, each partition being tapered so as to be thickest and highest from the flat base plate adjacent to the lower end of the flat baseplate, each channel opening into a separate downward opening.

5,183,254

GAME TARGET OVERLAY FOR BILLIARD TABLE

Robert Jones, 5740 Longview Dr., LaGrange, Ill. 60525

Filed Feb. 27, 1991, Ser. No. 661,686
Int. Cl.[5] A63D *15/00*
U.S. Cl. 273—14 **19 Claims**



1. A portable game accessory to a standard billiard table with enclosing rails and a playing surface for playing a special game, comprising:

a planar overlay having upper and lower planar surface and an area less than that of the playing surface carrying special game target indicia of geometric shape defining an area on at least one of said planar surface of the planar overlay in which a billiard ball is intended to land in the area for purposes of scoring in the game and in which the area is visible from the upper surface of the overlay said overlay having beveled edges which enable a billiard ball to roll up onto the upper surface of the overlay from the playing surface without significant deflection of a billiard ball; and

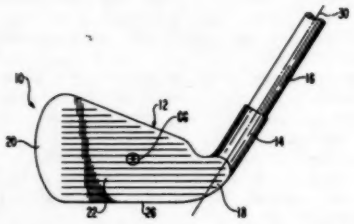
means for holding the overlay in a preselected one of a plurality of different positions relative to the enclosing rails on the playing surface against movement in response to a billiard ball rolling onto the upper surface.

5,183,255

GOLF CLUB WITH IMPROVED HOSEL CONSTRUCTION

Anthony J. Antonious, 7738 Calle Facil, Sarasota, Fla. 34238

Continuation of Ser. No. 732,088, Jul. 18, 1991, abandoned. This application Aug. 1, 1991, Ser. No. 739,089
Int. Cl.[5] A63B *53/04*
U.S. Cl. 273—167 G **17 Claims**



1. An iron type golf club head for hitting a golf ball comprising:

a golf club head body having a heel portion, a toe portion, a bottom sole, a top ridge, and a planar, lofted ball striking face extending therebetween, said ball striking face intersecting with a forwardmost progression of said bottom sole to define a leading edge of said club head body, said bottom sole also having a rearwardmost progression defining a trailing edge;

a hosel formed adjacent said heel portion and having a front surface and a rear surface, said trailing edge adjacent the heel portion of said club head body smoothly transitioning into said rear surface of said hosel;

an increased mass formed between the hosel and said bottom sole and defined by the trailing edge at the heel portion to provide additional structural integrity and strength at the heel portion of the club head;

said front surface of said hosel being positioned behind said leading edge of said club head body; and

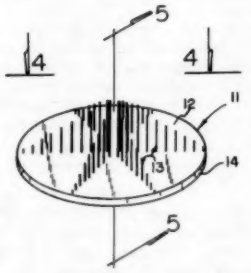
said hose has a centerline extending longitudinally therethrough, said centerline intersecting with an extended loft plane of said ball striking face at a point above a lower quadrant of said ball striking face.

5,183,256

GAME APPARATUS

Calvin L. Hale, Rte. 1, Box 273C, Macomb, Okla. 74852

Filed Apr. 27, 1992, Ser. No. 874,506
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—241 **4 Claims**



1. A game apparatus, comprising,

a support plate, the support plate having a plate top surface, with the top surface including plural rows of rigid rods, each row of said plural rows of rigid rods includes ascending rigid rods directed from a periphery of the support plate towards an axial center thereof, and

plural sets of beads, with the beads being adapted for selective mounting upon the rigid rods, and

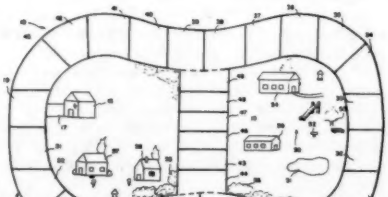
a dice set for directing a predetermined quantity of beads to be directed upon each of the rigid rods during play.

5,183,257

FIRE SAFETY AND HAZARDS GAME

Kirstina D. Shore, 1117 N. Ridge Dr., Yuba City, Calif. 95991

Filed Dec. 12, 1991, Ser. No. 805,893
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—243 **7 Claims**



1. An improved board game for promoting safety, comprising:

a) a board having a closed path including a first circumferential path including two opposed outwardly curved sections interconnected with two opposed inwardly curved sections and a second short-cut path interconnected between said inwardly curved sections;

b) said first path having a multiplicity of spaces having printing thereon related t fire safety issues, at least one further space having printing thereon related to cardiopulmonary resuscitation and a single space which, when landed upon, allows optional access to said second path;

c) said second path, when travelled, causing a player token to travel a shortened distance in travelling one lap about said closed path, said second path having a multiplicity of spaces including a plurality of spaces which, when landed upon, result in negative consequences and a single space which, when landed upon, results in no negative consequences;

d) a plurality of simulated awards, including awards for good citizenship and child of the year and a plurality of prizes including money, ice cream and a fire bucket, and spaces on said first path which, when landed upon, result in winning a prize or award;

e) further spaces on said first path which, when landed upon, result in losing a prize or award;

f) a space resembling a firehouse and connected to but separate from said first path;

g) a chance device which is used on each turn to control play;

h) whereby players take turns operating said change device and traversing said board, said players starting play on said space resembling a firehouse and being required to have a particular number displayed on said change device before being permitted to enter and transverse said first path, winning and losing prizes and awards and learning about fire safety, with the winner being that player who has retained the largest combined total of prizes and awards after transversing said closed path a particular chosen number of times.

5,183,258

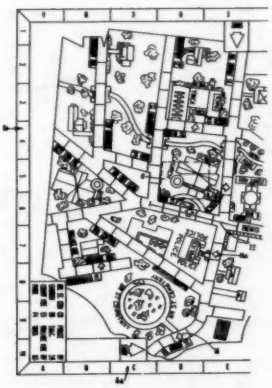
MAP READING GAME APPARATUS

Charles J. Lerke, P.O. Box 234, Whitehouse, N.J. 08888

Filed Nov. 19, 1991, Ser. No. 794,522

Int. Cl.[5] A63F *3/04*

U.S. Cl. 273—252 **9 Claims**



1. A board game apparatus for educating a player about the culture of a geographic entity comprising:

(a) a playing board having thereon a representation of a select geographic entity including points of interest and streets, the streets being divided into a plurality of spaces for receiving a game piece, wherein a minor portion of said spaces are event spaces;

(b) at least one game piece for moving along said spaces;

(c) at least one point of interest card having thereon points of interest shown on the playing board;

(d) a travel itinerary card having described thereon at least one point of interest that must be reached by the player;

(e) means for selecting a number of spaces for moving the game piece along a street in the direction of a point of interest described on said players point of interest card and travel itinerary card; and

(f) a plurality of event cards identifying a cultural event located on the playing board such that when a player lands on an event space, the player selects an event card and moves one of his game pieces to any space identified by the event shown on the event card;

wherein the playing board comprises a listing of the points of interest and a corresponding grid in which each point of interest is located.

5,183,259

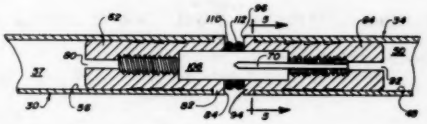
FLUID RESERVOIR CONTAINING ARROW

Robert K. Lyon, 4257 Wedgewood Ct., Indianapolis, Ind. 46254

Filed Jan. 30, 1992, Ser. No. 828,039

Int. Cl.[5] F42B *6/04*

U.S. Cl. 273—418 **17 Claims**



14. An arrow comprising;

a first shaft member;

a second shaft member having an exterior surface, and an interior surface defining a reservoir portion capable of containing a fluid;

a first cap member having an outer surface attachable to the first shaft member, and a threaded inner surface;

a second cap member having an outer surface attachable to the interior surface of the second shaft member, a threaded inner surface, and an aperture in fluid communication with the reservoir portion; and

a stud member having a first threaded end portion for threadedly engaging the first cap member, a second threaded end portion for threadedly engaging the second cap member, a middle portion extending between the first and second end portions, a first fluid conduit extending in at least a portion of each of the second end portion and middle portion, and a sealing means for selectively sealingly engaging the first and second shaft members to controllably regulate the flow of fluid therebetween.

5,183,260

TENNIS RACKET

Elie B. Kheir, 2825 Downing Cir., Birmingham, Ala. 35242

Filed Jan. 31, 1992, Ser. No. 828,511

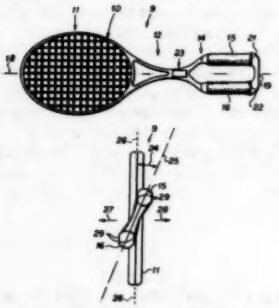
Int. Cl.[5] A63B *49/08*

U.S. Cl. 273—73 J **5 Claims**

1. An improved tennis racket comprising a racket head **(11)** for supporting a network of strings lying in a first common plane **(26)**, an elongated throat **(12)** extending from the racket head, and two separate elongated handles **(15,16)** each having an elongated central axis and adapted to be separately grasped and spaced side-by-side with respect to each other and mounted to the distal end of the throat for gripping the tennis racket, wherein the improvement comprises:

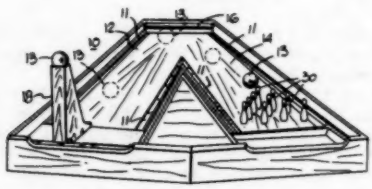
the central axis of each of the two handles being oriented to lie in a second common plane **(25)**, and the first common

plane being set angularly apart from the second common plane by an angle of 10 to 40 degrees,



the two handles being rigidly mounted to the throat so that movement of either handle is directly imparted to the racket head.

5,183,261
BUMPER BOWLING GAME WITH GRAVITY RELEASED BALL PROJECTOR
Josef Nobi, 7808 Lela La., Loveland, Colo. 80538
Filed Dec. 16, 1991, Ser. No. 808,096
Int. Cl.[5] A63D *3/02*
U.S. Cl. 273—38 **1 Claim**



1. A bumper bowling game comprising:

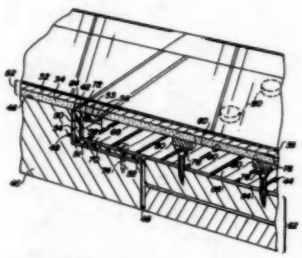
table means having an outgoing alleyway and a return alleyway, each of the outgoing and return alleyways being elongated and having proximal and distal ends, the outgoing and return alleyways being joined at distal ends thereof such that longitudinal axes of said outgoing and return alleyways form an acute angle, each of the outgoing and return alleyways comprising a central flat surface and a concave gutter along each of left and right sides of said central flat surface;

ball starter means positioned at said proximal end of said outgoing alleyway for retaining a ball in a starting position atop said ball starter means, said ball starter means comprising a body member having a proximal end and a distal end, an upper surface of said body member defining a cup-shaped ball retainer at said proximal end of said body member and a concave starting ramp sloping downwardly from said cup-shaped ball retainer to said distal end of said body member, said body member including a vertical aperture aligned with said cup-shaped ball retainer, said ball starter means further comprising a vertical rod positioned within said vertical aperture for permitting vertical and pivotal motion of said body member with respect to said vertical rod to effect aiming and release of said ball, said ball starter means further comprising a foot member fixedly attached to a bottom end of said vertical rod, said foot member being arranged for sliding engagement within a transverse groove at the proximal end of said outgoing alleyway to thereby facilitate lateral movement of said ball ball starter means across said central flat surface of said outgoing alleyway, said ball starter means further comprising compression spring means positioned on said vertical rod for maintaining said body member in a pre-starting position in which said proximal end of said body member is slightly raised above said central flat surface of said outgoing alleyway and in which said ball is retained within said cup-shaped ball retainer, said compression means permitting said proximal end of said body member to be moved downward to a starting position in which said ball is moved upward out of said cup-shaped ball retainer by contact with the top end of said vertical rod to permit said ball to roll by gravity down said starting ramp to gain sufficient speed to enable it to roll in an outbound direction on said central flat surface of said outgoing alleyway toward the distal end thereof;

a linear bumper positioned at the joined distal ends of said outgoing and return alleyways for deflecting a ball previously released from said ball starter means to thereby cause the ball to reverse direction and to roll in a return direction on said central flat surface of said return alleyway toward the proximal end thereof; and

a plurality of pins arranged in a predetermined standing configuration at a proximal end of said return alleyway so as to be contacted and knocked down by said ball rolling in said return direction on said central flat surface of said return alleyway.

5,183,262
BOWLING LANE AND REFINISHING METHOD
Will Heddon, 1422 Chamberlain Loop, Lake Wales, Fla. 33853
Filed Apr. 5, 1991, Ser. No. 681,052
Int. Cl.[5] A63D *1/00*
U.S. Cl. 273—51 **13 Claims**



1. A method of constructing a bowling lane comprising the steps of:

providing an approach panel having a flat top surface and a step formed along one of said approach panel's sides;

providing a generally J-shaped foul line coupling having a flat top surface and an open portion;

providing a lane panel having a flat top surface and a step formed along one side of said lane panel's sides;

abutting said J-shaped coupling against said side of said approach panel within said step so that said foul line coupling's flat top surface and said approach panel's top surface are coplanar; and

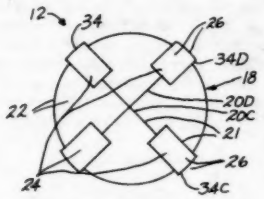
inserting the step of said lane panel into the open portion of the J-shaped coupling.

5,183,263

PASS-FOOTBALL

Christopher D. Kuebler, 1370 Sloane Ave., Suite 612, Lakewood, Ohio 44107

Filed Nov. 29, 1991, Ser. No. 800,848
Int. Cl.[5] A63B *43/02*
U.S. Cl. 273—65 EG **7 Claims**



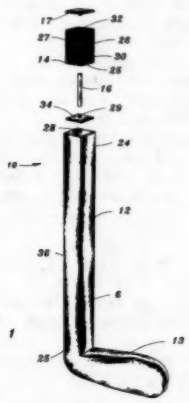
1. A pass-catch football toy comprising in combination:
a football having two ends and shaped as an oblate spheroid, said football having a core portion, a fleece covering the core, and a plurality of longitudinal seams extending between said ends;
said fleece comprising contact material having a plurality of loop-shaped snags over the outer surface of said fleece;
a plurality of grip-tabs comprising contact material and being adhered to said fleece longitudinally on each of said plurality of longitudinal seams, each of said plurality of grip-tabs having a plurality of loop-shaped snags;
a flexible catching glove dimensioned to receive and tightly fit a player's hand, the catching glove having front and back surfaces with strips of hook material adhered on said front surface of the fingers and thumb of the glove, said hook material having a plurality of hooks adapted for securing to the loop-shaped snags of the fleece and grip-tabs upon contact with said football.

5,183,264

HOCKEY STICK

Paul A. Lanctot, 520 Sand Hill Rd., Scotts Valley, Calif. 95066

Filed Apr. 9, 1992, Ser. No. 865,177
Int. Cl.[5] A63B *59/12*
U.S. Cl. 273—67 A **18 Claims**



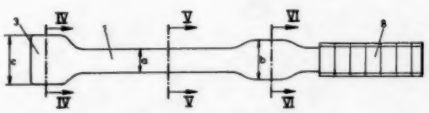
1. A hockey stick comprising:
a blade and a stick portion,
a tubular member inserted into said stick portion of said hockey stick, having a first end and a second end, said first end having an opening therein,
a spine member secured within said tubular member,
a plurality of particles interiorly disposed within said tubular member,
a fluid interiorly situated within said tubular member, and
means for sealing said opening in said first end of said tubular member.

5,183,265

RACQUETS, IN PARTICULAR TENNIS RACQUETS

Helmut Umlauft, Hard, and Karl-Heinz Wäger, Götzis, both of Austria, assignors to Head Sportgerate Gesellschaft m.b.H. & Co. OHG, Kennelbach, Austria

PCT No. PCT/AT90/00091, § 371 Date May 16, 1991, § 102(e) Date May 16, 1991, PCT Pub. No. WO91/03283, PCT Pub. Date Mar. 21, 1991
PCT Filed Sep. 11, 1990, Ser. No. 659,307
Claims priority, application Austria, Sep. 11, 1989, 2123/89
Int. Cl.[5] A63B *49/02*
U.S. Cl. 273—73 C **17 Claims**



1. A tennis racquet, comprising:
a handle;
a stretcher frame secured via a throat region to the handle for stringing a racquet head in which the cross-sectional area of the stretcher frame measured transversely to the stringing plane as at least one section of largest dimension, such that the cross-sectional area of the stretcher frame in the throat region and in the region of the racquet head remote from the throat region is greater than in the region of the stretcher frame lying therebetween; and
wherein the cross-sectional area in the region of the racquet head remote from the throat region is greater than the cross-sectional area in the throat region; and
wherein the cross-sectional area of the frame in the throat region is essentially constant.

5,183,266

BASEBALL BOARD GAME

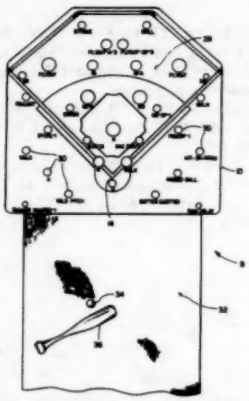
Michael Kohler, 137 Young Cir., Coopersburg, Pa. 18036

Continuation of Ser. No. 547,478, Jul. 2, 1990, abandoned. This application Dec. 23, 1991, Ser. No. 814,264
Int. Cl.[5] A63F *7/20*
U.S. Cl. 273—88 **5 Claims**

3. A baseball board game, comprising,
a game board defining a substantially flat, horizontally arranged playing surface, means for defining a representation of an infield, an outfield and foul territory upon said playing surface of said game board,
a vertically disposed wall secured to said playing surface proximate to a first edge of said playing surface,
a plurality of holes of different sizes arranged about and in said playing surface and said wall and being selectively designated to define fly-outs, strikes, balks, balls, walks, steals, foul-outs, errors, bunts, strike-outs, wild pitches, ejected batters, rain delays, injured runners, ground-outs, hits by pitch, pick-offs, passed balls and single, double and triple base hits; said holes defining said single base hit being located in said means representing said outfield and said holes defining said double and said triple hits being located adjacent a boundary between said means representing said outfield and said means representing said foul territory;
a textured batting surface positioned adjacent to a second edge of said playing surface opposite said first edge and substantially in the same plane as said playing surface;
a bat unattached to said playing surface and said batting

surface and which is adapted to be swung by a first game player; and

a ball unattached to said playing surface and said batting surface and which is adapted to be propelled across said batting surface by a second game player;



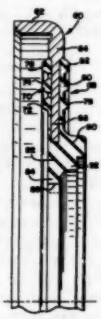
whereby when said second game player propels said ball along said batting surface and said first game player swings said bat to strike said ball, said ball is caused to be propelled onto said playing surface and toward and into one of said holes to simulate the probability of occurrence of respective baseball plays and events during an actual baseball game.

5,183,267

SEAL FOR SENDING UNIT

Yuri Ackerman, Chicago, Ill., and Joseph A. Gutierrez, Farmington Hills, Mich., assignors to Chicago Rawhide Manufacturing Co., Elgin, Ill.

Filed Dec. 10, 1987, Ser. No. 131,107
Int. Cl.[5] F16J *15/12*
U.S. Cl. 277—12 **10 Claims**



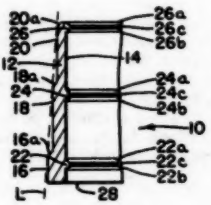
1. An oil seal unit for disposition between portions of mating parts having opposed end face sealing surfaces and means for urging said mating parts together in fluid-tight relation, with one of said mating parts also having a shank portion adapted to extend axially through an associated seal unit, said oil seal unit comprising, in combination, a casing unit having an axially extending centering flange portion and a radially extending bonding flange portion with opposed end face surfaces and an inner margin portion, and an elastomeric seal body bonded to said casing unit, said body having radially inner, outer and intermediate seal body portions, said radially outer elastomeric seal body portion including at least one substantially continuous circumferential sealing rib overlying one of said casing end face surfaces and at least one substantially continuous circumferential sealing rib overlying the other of said casing end face surfaces, said radially inner portion of said elastomeric seal body including a radially extending web terminating in a radially inner, axially extending web surface portion defining an opening through which said shank portion of said one mating part may extend, said web also including means forming a part thereof for engaging said shank portion of said one mating part so as to support said seal relative to said one mating part, said intermediate seal body portion including an element adapted to be deformed into snug fluid-tight sealing engagement within a recess defined in part by said seal unit and in part by said opposed end face sealing surfaces forming said portions of said mating parts.

5,183,268

METAL-TO-METAL WELLHEAD SEAL FOR ROUGH CASING

Henry Wong; Ronald D. Quates, both of Houston, and Lien-Yan Chen, Spring, all of Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 30, 1991, Ser. No. 693,206
Int. Cl.[5] F16J *15/46, 15/08;* **E21B** *33/02*
U.S. Cl. 277—27 **13 Claims**



1. A metal seal device for providing a fluid pressure metal-to-metal seal between a non-machined rough surface of a well casing and a surrounding wellhead component, the seal device constructed entirely of metal and comprising

a) an annular all metal seal body having an upper end, a lower end, a cylindrical inner surface extending between said upper and lower ends, and an outer surface formed by a plurality of cylindrical surface portions having mutually different diameters;

b) a plurality of axially-spaced annular internal ridges on the body inner surface, said ridges having sealing surfaces for establishing a metal-to-metal seal with a non-machined rough surface of a well casing; and

c) a plurality of annular external sealing surfaces on the body outer surface, said external sealing surfaces axially positioned to reside on a straight line that slopes inwardly from the lower end of the body towards the body axis.

5,183,269

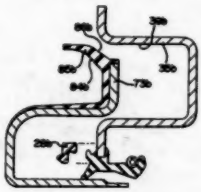
UNITIZED GRIT SEAL WITH REMOVABLE THRUST BUMPER

David D. Black, Elgin, and Anthony W. Vering, Arlington, both of Ill., assignors to Chicago Rawhide Manufacturing Co., Elgin, Ill.

Filed Feb. 6, 1991, Ser. No. 651,562
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—37 **18 Claims**

1. A unitized, fluid retaining and grit exclusion seal assembly for heavy duty applications, said seal assembly comprising, in combination, an annular primary seal unit, an annular wear sleeve assembly having an annular wear sleeve casing, an excluder lip portion, and a thrust bumper element, said primary seal unit comprising a casing having a mounting portion and a

radially extending flange portion for positioning an elastomeric primary seal body, said elastomeric primary seal body having one portion thereof bonded to a radially inner margin of said radial positioning flange, said elastomeric seal body being defined in part by air and oil side frustoconical surfaces meeting along a generally circular locus to form a primary seal band area of intended contact with a portion of said wear sleeve casing, said wear sleeve comprising a generally cylindrical, axially extending flange positionable in fluid tight relation with an associated rotary shaft to be sealed and at least one radial flange extending outwardly from the axially outer portion of said cylindrical flange, with the radially outwardly directed surface of said cylindrical flange being constructed, arranged



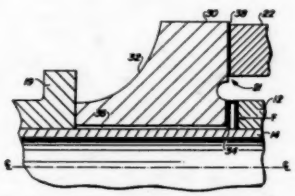
and sized for fluid sealing contact between a portion of its surface and said seal band area on said seal lip body, with said excluder lip portion of said wear sleeve assembly having a lip end portion contacting a cooperating portion of said primary elastomeric primary seal casing, said thrust bumper element being made from a stiff but resilient high temperature resistant, lubricous plastic material, and including a thrust bumper body portion having opposed tapered surfaces meeting to define a narrow band of intended contact with an end face of a radial flange on one of said wear sleeve casing and said primary seal casing, said bumper body being positioned in use relative to said one casing so that said narrow contact band in use is, at most, slightly spaced from said end face surface of said one of said wear sleeve casing and said primary seal casing.

5,183,270

COMPOSITE SEAL ROTOR

Charles J. Alten, Scottsdale; John S. Cuccio, Jr., Chandler; Harry L. Kington, Scottsdale, and James D. Fontana, Phoenix, all of Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Sep. 16, 1991, Ser. No. 760,419
Int. Cl.[5] F16J *15/34*
U.S. Cl. 277—81 R **7 Claims**



1. A seal rotor for sealing between rotating components of a gas turbine engine mounted on a rotating shaft and a housing circumscribing said rotating components and shaft, wherein said rotating components are held together by the compressive force generated by a lockup assembly and said housing has a stationary carbon face seal mounted thereto, said seal rotor comprising:

a metal ring mounted for rotation to said rotating shaft and disposed intermediate two of said rotating components for transmitting said compressive force therebetween;

a ceramic ring radially spaced apart and circumscribing said metal ring and having an axial face for sealingly engaging an axial face of said carbon face seal; and

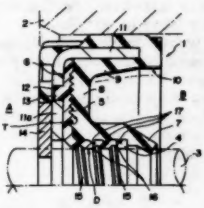
a metal cylindrical member radially disposed between said metal ring and said ceramic ring, said cylindrical member attached along a portion of its inner surface to said metal ring and attached along a portion of its outer surface to said ceramic ring.

5,183,271

SEALING DEVICE AND MANUFACTURING METHOD OF THE SAME

Noriyuki Wada, and Takayuki Nishigaki, both of Fukushima, Japan, assignors to NOK Corporation, Tokyo, Japan

Filed Jan. 24, 1991, Ser. No. 645,442
Claims priority, application Japan, Jan. 25, 1990, 2-15912; Feb. 7, 1990, 2-27386
Int. Cl.[5] F16J *15/32*
U.S. Cl. 277—152 **4 Claims**



1. A sealing device disposed between a first member and a rotatable shaft which is rotatable relative to the first member comprising:

a first seal ring having a resin seal lip, said first seal ring having a radially extending flange portion annularly disposed about the rotatable shaft and said resin seal lip extending coaxially about the rotatable shaft along an axial direction of the rotatable shaft, said resin seal lip having a first sealing surface in contact with the rotatable shaft and a second sealing surface on an opposite side of said resin seal lip;

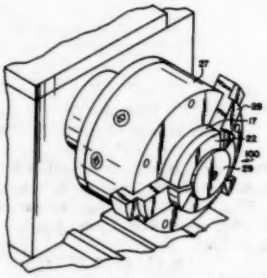
a second seal ring having an elastic rubber seal lip, said second seal ring having a radially extending flange portion annularly disposed about the rotatable shaft, said rubber seal lip extending coaxially about said resin seal lip of said first seal ring along an axial direction of the rotatable shaft, said rubber seal lip having a first sealing portion extending axially beyond said resin seal lip which is in sealing contact with the rotatable shaft; said radially extending flange portion of said second seal ring having a first surface in facing contact with said radial portion of said first seal ring, and said rubber seal lip having a second portion having a second surface which is in facing contact with said second sealing surface of said resin seal lip so as to be relatively movable with respect to said second sealing surface of said resin seal lip;

said second sealing surface of said resin seal lip having an annular cutout groove therein, said annular cutout groove having first and second sidewalls which extend at different angles to a plane which is perpendicular to the rotational axis of the rotatable shaft, as viewed in longitudinal section;

said elastic rubber seal lip of said second seal ring having an annular projection mating with said annular cutout groove; and

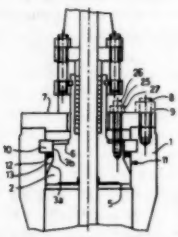
means for firmly securing said first and second seal rings.

5,183,272
UNIVERSAL CHUCK STOP
Einar J. Tyvela, 24636 Luns Ford Ct., Damascus, Md. 20872
Filed Nov. 6, 1991, Ser. No. 788,599
Int. Cl.[5] B23B 3/02
U.S. Cl. 279—156 20 Claims



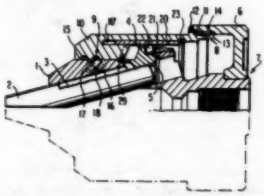
1. An apparatus for use with a multi-jaw chuck, comprising:
a tubular hub section securing means which is inserted in a central bore of said chuck, thereby, securing said apparatus in place relative to said chuck;
a plurality of webs extending radially outwardly from said tubular hub section, said webs having a first face which is freely disposed squarely on a face of said chuck, and a second work support opposite face which is parallel to said first face, said webs having gaps thereinbetween through which the adjustable jaws of said chuck are radially displacable.

5,183,273
SEALING GASKET FOR A CONTROL VALVE
Jean-Pierre Dennys, Maillot, France, assignor to Societe Industrielle D'Equipment Mecanique, France
Filed Feb. 21, 1991, Ser. No. 658,990
Claims priority, application France, Feb. 23, 1990, 9002245
Int. Cl.[5] F16J 15/24
U.S. Cl. 277—170 7 Claims



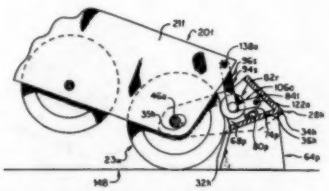
1. A sealing gasket for a control valve, said control valve having a body with an internal wall, a plug being disposed within the body of said control valve, said plug being movable in an axial direction within said control valve body on an operating stem passing therethrough, said plug having a bottom surface which is subjected to high pressure produced by fluid which flows within said control valve and urges said plug to move upwards;
said plug having an external lateral wall comprising a first upper portion which contacts said internal wall of said control valve body and a second lower inclined portion which is inclined away from said internal wall of said control valve body to define a space between said internal wall and said plug;
said gasket being disposed in said space, said gasket comprising two parts, a rigid upper part and a deformable lower part nested together, said deformable part being disposed below said rigid part and having an inner inclined surface which contacts said lower include portion of said plug, so that, during said upward movement of said plug, all of said inner inclined surface of said deformable part is subjected to force from said plug causing said deformable part to compress and to seal said space in said control valve.

5,183,274
CHUCK FOR TOOLS
Kazuo Sakamaki, Ojiya, Japan, assignor to Yukiwa Seiko Kabushikikaisya, Ojiya, Japan
Filed Feb. 25, 1992, Ser. No. 841,066
Claims priority, application Japan, Jun. 13, 1991, 3-142041
Int. Cl.[5] B23B 31/12
U.S. Cl. 279—62 15 Claims



7. A chuck for a tool, comprising:
a chuck body (1, 7) having a grip sleeve (6) which is gripped by a user's hand;
a chucking means (2) for clamping a tool;
a rotational sleeve means (10) for transmitting a rotational force, applied by the user, to the nut sleeve (4) to advance/retract the chucking means (2), said rotational sleeve means being slidingly movable in the axial direction relative to said chuck body;
a rotation preventing means (12, 14) for preventing said rotation of said rotational sleeve means;
a slide restricting means (15, 17) for restricting the axial sliding movement of said rotational sleeve means.

5,183,275
BRAKE FOR IN-LINE ROLLER SKATE
Robert F. Hoskin, 3851 Angora Pl., Duluth, Ga. 30136
Filed Jan. 30, 1992, Ser. No. 828,352
Int. Cl.[5] A63C 17/14
U.S. Cl. 280—11.2 10 Claims



1. A brake for applying braking forces to an in-line roller skate used on a skating surface through the periphery of one of the skate wheels thereof comprising:
mounting means mounted on the roller skate;
roller means rotatably mounted on said mounting means and adapted to selectively engage the periphery of the skate wheel;
braking means for applying a resistive force to said roller means to retard rotation of said roller means and also the skate wheel when said roller means is in engagement with the skate wheel; and,
actuating means for selectively moving said roller means into contact with the periphery of the skate wheel and said

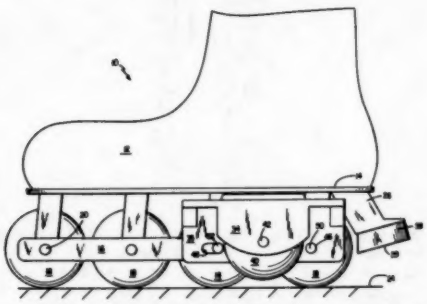
braking means into contact with said roller means, said actuating means including ground-engaging means for selectively engaging the skating surface upon tilting of the roller skate to move said roller means into contact with the skate wheel and said braking means into contact with said roller means, thereby causing said braking means to apply said resistive force to said roller means and the rotation of said roller means to be retarded and thus applying a braking force to the skate wheel in opposition to the rotation thereof.

5,183,276

TRAINING WHEEL FOR IN-LINE SKATES

Kenneth W. Pratt, Ware, Mass., assignor to Seneca Sports, Inc., Milford, Mass.

Filed Jan. 28, 1992, Ser. No. 827,421
Int. Cl.[5] A63C *17/06*
U.S. Cl. 280—11.22 **18 Claims**



1. A training wheel device for use with a tandem or in-line roller skate having a series of travel rollers disposed for travel along a travel surface in a single travel line, the tandem roller skate further comprising a travel roller bracket, the travel rollers being mounted for rotation on parallel travel roller axles mounted on the travel roller bracket, said training wheel device comprising:

a training wheel bracket,

a training wheel mounted upon said bracket, and

means for mounting said device upon the tandem roller skate, said means for mounting said device upon the tandem roller skate comprising at least two elongated travel roller axles and said training wheel bracket defining at least a pair of apertures for receiving said elongated travel roller axles therethrough, at least one said aperture of said at least a pair of apertures comprising an elongated slot to accommodate a range of distances between said at least two elongated travel roller axles,

said training wheel adapted to engage upon the travel surface for travel in a balance line to enhance the balance of a user, the balance line being spaced from and generally parallel to the travel line of the travel rollers.

5,183,277

STEERABLE ROLLER SKATE

Kuo-Tai Tang, c/o Hung Hsing Patent Service Center P. O. Box 55-1670, Taipei (10477), Taiwan

Filed May 13, 1991, Ser. No. 699,133
Int. Cl.[5] A63C *1/24*
U.S. Cl. 280—11.28 **4 Claims**

1. A steerable roller skate comprising:

a sole member having a skate boot formed on said sole member;

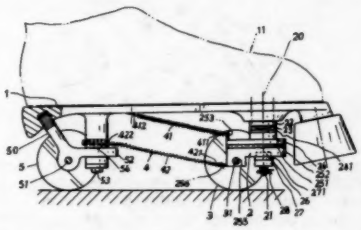
a pair of rear wheels rotatably transversely secured to a rear bottom portion of said sole member;

a steering means steerably secured on a front bottom portion of said sole member;

a pair of front wheels rotatably transversely secured on said steering mean; and

a tensioning spring set securing and tensioning said steering means to said sole member normally restoring said sole member and said wheels for a safety straight-forward running of a roller skate,

said steering means including: a front bolt generally vertically secured in said front bottom portion of the sole member about a front vertical axis generally perpendicular to a longitudinal axis longitudinally formed in a central portion of the sole member, a hollow stem secured under the sole member for passing the front bolt through the hollow stem, a front cushioning packing disposed around



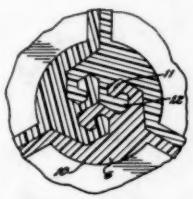
the front bolt and retained on the hollow stem, an upper radial bearing provided with an upper central hole therein for passing the front bolt for rotatably retaining an upper surface of a steering base on the front bolt and positioned under the front cushioning packing by an upper washer, the steering base having a central bolt hole rotatably engageable with the front bolt protruding downwardly through the steering base and through an axial bearing fixed in a socket formed in a central bottom portion in the steering base, a lower radial bearing having a lower central hole for passing the front bolt for rotatably securing a lower surface of the steering base on the front bolt; and a nut secured on a lowest end of the front bolt for limiting the lower radial bearing on the front bolt.

5,183,278

RECYCLING TRASH CAN

Merle W. Wade, Jr., 8 Circle Rd., Millersville, Pa. 17551

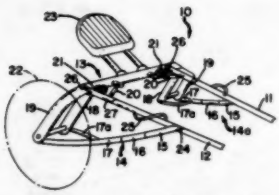
Filed Nov. 2, 1990, Ser. No. 608,274
Int. Cl.[5] B62B *3/04*
U.S. Cl. 280—47.35 **1 Claim**



1. A trash collection means comprising, bottom tray having wheels and of circular shape, three refuse containers each having a circular outer wall, two side walls and an inner wall so each of said containers resemble a pie shape when viewed from above, said three containers capable of fitting alongside each other within said bottom tray, said containers having two locking members on said inner wall, each locking member having an extended portion, said extended portion bent inward from said interior wall along three approximately 120 degree bent portions, and an end portion attached to said extended portion, said end portion having a hexagonal shape when viewed from above, said hexagonal portion forming a hexagonal shaped inner space along with said bent portions, said inner

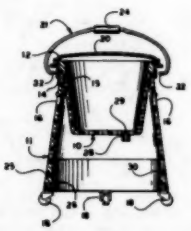
space capable of enclosing an end portion so that said locking portions may fit into one another.

5,183,279
SULKY
Michael J. Acerno, 262 Highway 33, Freehold, N.J. 07728, and Mark A. Guarino, 30 Runyon Dr., Trenton, N.J. 08610
Filed Apr. 9, 1991, Ser. No. 682,628
Int. Cl.[5] B62C *1/08*
U.S. Cl. 280—63 **10 Claims**



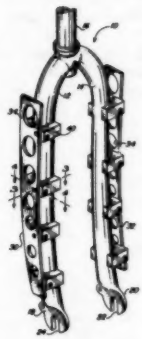
1. A sulky for carrying a rider behind a horse consisting essentially of an arch, a pair of wheels connected to said arch, a pair of rails extending from said arch forward in the direction of said horse, one on each side thus establishing a plane, and said direction of said rails establishing a longitudinal axis of said sulky, coupling means for coupling said rails at their rearmost ends to said arch, said coupling means including means for permitting lateral movement of said rails about vertical pivot axes relative to said arch, fork means connected between said rails and said arch and movement-stabilizing means for connecting each of said rails to said arch and lying substantially in said plane between said rails and between said arch and said horse, each movement stabilizing means including a shock absorber connected between each rail and said arch and flexible coupling means connected between the rearmost end of each rail and said arch for permitting limited lateral movement of said rails about said vertical pivot axes while preventing rotational movement of said rails relative to said arch.

5,183,280
MULTI-PURPOSE ELEVATED BUCKET
Jeffrey Gresch, 4541 Patrick Dr., R.R. 5, Kennesaw, Ga. 30144-1601
Filed Oct. 10, 1991, Ser. No. 774,626
Int. Cl.[5] B62B *3/00*
U.S. Cl. 280—79.5 **7 Claims**



1. A multipurpose container comprising a bucket, a skirt fixed to said bucket and extending below said bucket, and handle means for selectively lifting said container, said bucket being frustoconical in shape and including an upper edge and a bottom said bottom having a diameter less than the diameter of said upper edge, said skirt being fixed to said bucket adjacent to said upper edge of said bucket so that said skirt surrounds said bucket, said skirt having an upper edge generally the same size as said upper edge of said bucket and fixed thereto, said skirt having a lower edge below said bottom of said bucket and larger than said upper edge so that said skirt is frustoconical for providing stability for said container, said handle means including a plurality of holes defined in said skirt adjacent to said upper edge of said skirt, said plurality of holes constituting handholds.

5,183,281
BICYCLE FRAME ELEMENT PROTECTOR
David M. Stephens, 16026 N. 8th St., Phoenix, Ariz. 85022
Filed Mar. 15, 1991, Ser. No. 669,928
Int. Cl.[5] B62K *21/02*
U.S. Cl. 280—279 **23 Claims**



1. Apparatus for protecting a frame element of a vehicular frame, said apparatus comprising in combination:

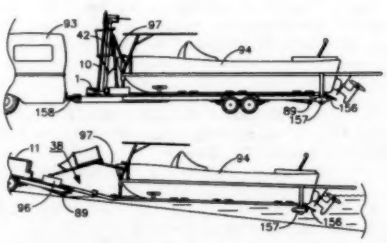
a) a protective member for shielding the frame element against denting and gouging;

b) at least one standoff for attaching said protective member to the frame element;

c) means for clamping said standoff to the frame element; and

d) means for securing the protective member to said standoff.

5,183,282
TRAILERED CRADLE AND BOAT/YACHT MANAGING METHOD
George M. Smyly, Sr., 1903 B Carlton St., North Charleston, S.C. 29405
Continuation-in-part of Ser. No. 458,519, Dec. 28, 1989, Pat. No. 5,004,260. This application Mar. 25, 1991, Ser. No. 674,466
Int. Cl.[5] B60P *3/10*
U.S. Cl. 280—414.1 **30 Claims**



1. An improved launcher/retriever boat cradle and trailered boat cradle of the type having a boat keel support platform; a buoyant wheeled cross tee member being secured to the aft end of said boat keel support platform; a winch means for launching and recovering said cradle; a folding stabilizer pivotally

secured to two vertical members of a second cross tee, said second cross tee being secured to a forward vertically secured member of said boat keel support platform, said folding stabilizer being also pivotally secured to a stabilizer platform, said stabilizer platform including side support members, said side support means having a slippery entrapment upon two rails; wherein the improvement comprises:

(a) a wheeled chassis including a tow bar, said tow bar being pivotally attached to said chassis and having hitcher components thereof releasably connected to a towing vehicle;

(b) a pair of laterally spaced-apart primal rollers sandwiching a smaller diameter pilot roller, said primal rollers and pilot roller being rotatably mounted upon an initial axle;

(c) a pair of laterally spaced-apart primal guide brackets supporting said initial axle, said primal guide brackets being fixedly attached at a rear distal position upon siad chassis, said initial axle being laterally arranged with respect to said wheeled chassis, said primal guide brackets having inward facing surface areas extending above said primal rollers, said boat keel support platform resting upon said primal rollers and being aligned between said inward facing surface areas of said primal guide brackets;

(d) a plurality of pairs of laterally spaced-apart secondary rollers, each pair of said secondary rollers being rotatingly mounted upon a secondary axle;

(e) a pair of laterally spaced-apart alignment brackets supporting each of said secondary axles, said alignment brackets being fixedly attached upon said wheeled chassis, each of said secondary axles being laterally arranged with respect to said wheeled chassis, said alignment brackets having inward facing surface areas extending above said secondary rollers, said boat keel support platform resting upon said secondary rollers being aligned between said inward facing surface areas of said alignment brackets;

(f) an elongate skid platform, said skid platforms being longitudinally arranged and fixedly attached upon said chassis, said skid platform being medially arranged between said laterally spaced-apart secondary rollers;

(g) a track including longitudinally arranged parallel members fixedly attached upon said chassis;

(h) a break-back, fold up/out, cradle governor, said cradle governor including first elongate and second less elongate sections of rigid material, said governor first and second sections of rigid material being hinged together, said governor second section of rigid material having a rear distal end thereof pivotally connected to a forward end of said keel support platform, said governor being supported upon said pilot roller and captured between said primal rollers, said keel support platform moving rearward and relinquishing support upon said primal rollers, a pair of sliders fixedly attached at end points of a cross member of said governor first section of rigid material, a launcher cable, said launcher cable being attached to a launcher cable tie point at a forward end of said governor first section of rigid material, said launcher cable extending from said governor, training about launcher pulley members of said chassis and returning to said winch means, a retriever cable, said retriever cable being attached to a retriever cable tie point on said governor first section of rigid material, said retriever cable tie point being disposed below apertured hinge members of said governor first section of rigid material, said retriever cable extending to said winch means, said governor first and second sections of rigid material being formed to provide trench like spaces along the bottom surfaces thereof for receiving and housing lengths of said launcher and retriever cables; and

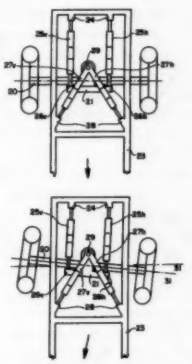
(i) an elogated cradle governor lift, said lift including a rigid elongate tubular housing having a rigid elongate tubular insert slidingly inserted within a first open end thereof, said insert having a cantilevered boost member forming a distal end thereof and serving as a stop, said boost member of insert coming into contact with a surface area adjacent said first open end of said tubular housing, said boost member of insert member of lift being pivotally joined to a cantilevered lift bar, said lift bar forming an upper forward member of said governor first section of rigid material, said tubular housing having a second end thereof pivotally attached to brackets, said brackets being fixedly attached at a forward location upon said chassis, said lift maintaining said governor is a break-back and folded attitude, said keel support platform being retrieved to a forward position upon said wheeled chassis and resting upon said primal and secondary rollers, beginning rearward movement of said keel support platform causing said lift to begin unfolding said governor, continued rearward movement of said keel support platform allowing said governor to reach a prone folded out position upon said skid platform, continued rearward movement of said keel support platform resulting in said sliders being slidingly received/captured by said track, said prone governor and keel support platform continuing to move rearward, said governor insert member extending from within said housing member of said governor lift.

5,183,283

APPARATUS FOR LIMITING LATERAL MOVEMENT IN TRAILERS

Assai Jarlsson, Kinnarps AB, Box 3060, S521 03 Falkoping, Sweden

Filed Nov. 1, 1989, Ser. No. 429,931
Int. Cl.[5] B62D *13/02*
U.S. Cl. 280—426 **9 Claims**



1. A device for connecting a wheel axle of a towed vehicle to the vehicle body to compensate for inertial forces while turning, the vehicle body having a longitudinal axis, the device comprising:

mounting means for resiliently connecting the axle to the vehicle body, said mounting means including pivot means located intermediate the ends of the axle for pivotably mounting said axle for relative movement about a substantially vertical axis, and

first and second bracket means each having first and second ends, each of said first ends being connected by connection means to the body in spaced apart relation on opposite sides of said pivot means, said connection means including a resiliently deformable member carried by one of said first ends and said body and a pin engaged by said resiliently deformable member, said pin being carries by the other of said first ends and said body, each of said second ends being connected to said mounting means on opposite sides of said pivot means,

said vertical axis of said pivot means being offset a selected distance along the longitudinal axis of the vehicle from said axle relative to the direction of movement of the vehicle to establish a moment arm responsive to inertial

forces while turning to rotate said axle about said vertical axis.

5,183,284

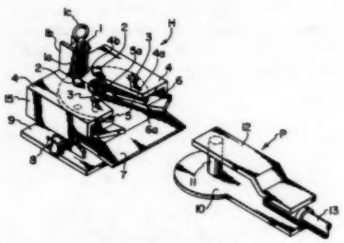
COUPLING MECHANISM

Walter Paplinski, Edmonton, Canada, assignor to George Glenn Neis, Red Deer, Canada, a part interest

Continuation-in-part of Ser. No. 585,647, Sep. 20, 1990, abandoned. This application Jul. 12, 1991, Ser. No. 729,835

Int. Cl.[5] B60D *1/01*

U.S. Cl. 280—508 **11 Claims**



1. A coupling mechanism comprising

(a) first and second parallel plates interconnected in a spaced relationship and together defining an opening for receiving a pin oriented perpendicular to said plates, said mechanism being adapted for mounting with said plates lying in substantially horizontal parallel planes;

(b) a pair of jaws pivotally mounted between said plates to be movable between a closed position coupling with said pin and an open position releasing said pin;

(c) said jaws having respective faces that in the closed position define a space;

(d) a locking member slidably mounted for movement through one of said plates between a locking position extending through said space between the jaw faces and into engagement with the other plate to retain the jaws in the closed position, and a withdrawn position permitting movement of the jaws to the open position to allow withdrawal movement of the pin from the mechanism; and

(e) a third plate secured parallel to and spaced below the lower one of said first and second plates, said lower and third plates defining a space for receiving a horizontally oriented load transmitting plate attached to the pin for transferring a vertical force to the coupling mechanism.

5,183,285

SUSPENSION PROCESS AND APPARATUS OF THE TYPE HAVING DIFFERENT STIFFNESSES WITH PROVISION TO SMOOTH THE CHANGE FROM ONE STIFFNESS TO ANOTHER

Mauro Bianchi, La Garde Freinet, France, assignor to Mauro Bianchi S.A., Puteau, France

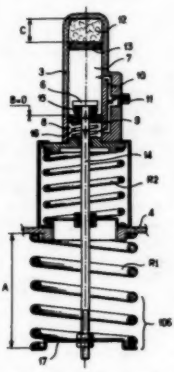
Filed Jul. 8, 1991, Ser. No. 726,987

Claims priority, application France, Jul. 6, 1990, 90 08859

Int. Cl.[5] B60G *11/00*

U.S. Cl. 280—670 **18 Claims**

1. A suspension process for the wheels of a motor vehicle having a wheel suspension having an operating load position in which the suspension is deformed by a force equal to the weight of the vehicle, a suspended wheel position in which the suspension is deformed by a force less than the weight of the vehicle and a collapsed position in which the suspension is deformed by a force greater than the weight of the vehicle, the process comprising providing the suspension with a stiffness that is greater between said operating load position and said suspended wheels position than between said operating load



position and said collapsed position, said providing a gradual transition between said stiffnesses.

5,183,286

MOUNTING STRUCTURE FOR LOWER ARM BRACKET

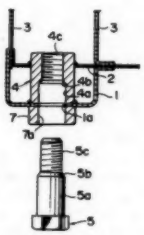
Kazuhiko Ayabe, Shizuoka, Japan, assignor to Suzuki Motor Corp., Japan

Continuation of Ser. No. 615,027, Nov. 16, 1990, abandoned. This application May 21, 1992, Ser. No. 888,466

Claims priority, application Japan, Mar. 2, 1990, 2-21304[U]

Int. Cl.[5] B62D *7/02*

U.S. Cl. 280—688 **2 Claims**



1. A structure for fixing a lower suspension arm bracket, comprising: a sleeve with upper and lower ends, said sleeve upper and lower ends being joined with a gusset plate and a lower side member by welds, said sleeve defining a fixing hole including a female threaded portion, a tapered intermediate portion and a non-threaded hole portion; a bolt engaging said fixing hole and engaging said lower arm suspension bracket to fix said lower arm suspension bracket to said lower side member, said bolt including a male threaded portion, an intermediate tapered portion and a stem portion, said male threaded portion being dimensioned to engage said female threaded portion of said fixing hole, said tapered portion being dimensioned to engage said fixing hole intermediate tapered portion and said stem portion having a diameter which is substantially the same as a diameter of said fixing hole such that said stem portion engages said fixing hole.

5,183,287

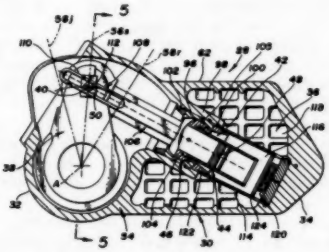
SUSPENSION SYSTEM FOR ROAD WHEEL OF A TRACK LAYING VEHICLE

Harry VanSweden, Utica, Mich., assignor to General Dynamics Land Systems, Inc., Sterling Heights, Mich.

Filed Jul. 30, 1991, Ser. No. 737,762

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—705 **13 Claims**



1. A suspension system for a road wheel of a track laying vehicle, comprising: a support arm having a first end that is mounted on the vehicle for pivotal jounce and rebound movement about a support axis; the support arm having a second end for supporting a road wheel spindle and also including a cavity for receiving a suspension liquid; a stationary crank arm having a connection location spaced from the pivotal axis of the support arm; a cylinder including a cylinder housing having a swivel bearing that mounts the cylinder housing for swiveling movement on the support arm in communication with the cavity; and the cylinder also including a piston slidably received within the cylinder housing in a sealed relationship and having a connection to the connection location of the crank arm such that the cylinder housing swivels with respect to support arm as the piston slides within the cylinder housing to compress the suspension liquid upon jounce pivoting of the support arm in order to thereby restrict the jounce pivoting, and the suspension liquid also operating on the piston to restrict rebound pivoting of the support arm.

5,183,288

AIR BAG DEVICE FOR AUTOMOBILE

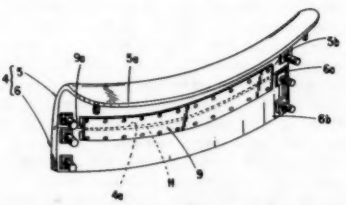
Haruhiro Inada, Hiroshima, and Hisao Muramoto, Yamaguchi, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 27, 1991, Ser. No. 675,622

Claims priority, application Japan, Mar. 28, 1990, 2-81732

Int. Cl.[5] B60R *21/16*

U.S. Cl. 280—732 **9 Claims**



1. An air bag device for an automotive vehicle, having at least an air bag disposed inside an instrument panel structure with an opening through which the air bag, while inflating, projects upon a collision of the automotive vehicle, said air bag device comprising:

lid means for covering the opening, said lid means including an upper lid and a lower lid, separate at all times from the upper lid, said upper lid capable of opening upwards and said lower lid capable of opening downwards to uncover the opening; and

a band-shaped connecting member attached to both a back of said upper lid and a back of said lower lid for joining said upper and lower lids together to form a single two-part lid, said connecting member being formed with a breakable line along which said connecting member is broken and separated, by inflation of the air bag, into two parts so as to allow said upper and lower lids to open.

5,183,289

HOUSING FOR PROTECTIVE AIR BAR RETAINING SYSTEMS OF AUTOMOTIVE VEHICLES

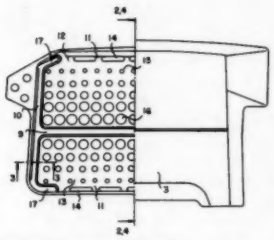
Gregor Zeller, and Konrad Randelzhofer, both of Aschaffenburg, Fed. Rep. of Germany, assignors to Petri, A.G., Aschaffenburg, Fed. Rep. of Germany

Filed Jun. 10, 1991, Ser. No. 711,527

Claims priority, application European Pat. Off., Jun. 9, 1990, 90110963.7

Int. Cl.[5] B60R *21/20*

U.S. Cl. 280—743 **32 Claims**



1. An air bag housing comprising:

an air bag receiving generator carrier;

a cover cap surrounding said generator carrier and exhibiting a predetermined breaking line, said cover cap including a reinforcing insert exhibiting a contour roughly corresponding to an area of said predetermined breaking line, said reinforcing insert configured with a plurality of flaps, said reinforcing insert further exhibiting a circumferential wall located proximal to said flaps, each of said flaps is connected along a substantially linear connecting line to said reinforcing insert along said circumferential wall; and

a safety plate connected to said cover cap.

5,183,290

AUTOMATIC SEAT BELT ASSEMBLY FOR A VEHICLE

Tae K. Chung, 473-9 Youngo-Ri, Jichun-Myun, Chilgok-Kun, Gyungbuck, Rep. of Korea

Filed Aug. 9, 1991, Ser. No. 743,030

Claims priority, application Rep. of Korea, Mar. 12, 1991, 91-4035

Int. Cl.[5] B60R *22/04, 22/08*

U.S. Cl. 280—802 **1 Claim**

1. An automatic seat belt assembly for a motor vehicle having at least one vehicle door, one vehicle seat, and one emergency release buckle, said automatic seat belt assembly comprising:

upper and lower webbings defining lower ends combined by a seat belt latch for locking in said emergency release buckle, and upper ends fixed to tongues of upper and lower moving latches,

a vertically elongated guide member having a hollow portion and upper and lower channeled stoppers communicated with said hollow portion, and

a retracting member installed on said vehicle door, said retracting member including:

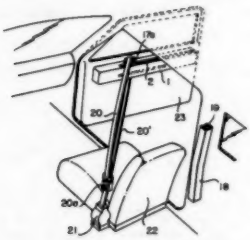
a housing having upper and lower slits disposed on a top and bottom thereof,

a two-way motor supported on an internal front wall of said housing, said two-way motor having a worm,

a driving pulley having a coaxial worm gear disposed in a geared relationship with said worm, said driving pulley operatively connected to a connecting pulley by a first wire, said connecting pulley supported on an internal back wall of said housing,

a moving box fixed to said first wire, said moving box having a pair of coaxial pinion gears disposed in a geared relationship with a pair of elongated rack gears supported on a ceiling and a base of said housing and a pair of coaxial spur gears disposed in a geared relationship with at least one short rack gear supported on the internal ceiling and base of said housing, and

a moving rod attached to each of said spur gears, each



moving rod having a roller and a second wire rotatably connected to said spur gear and said roller, said second wires secured to said moving latches, respectively,

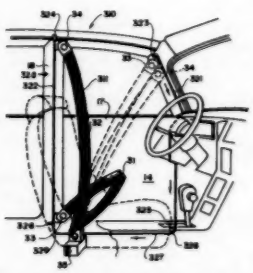
whereby, when the vehicle door is closed, the two-way motor rotates in a counter-clockwise direction, the moving box moves towards said back wall, and simultaneously, the moving latches move towards said back wall to ends of the moving rods and thereafter, both moving latches move up to the channeled stoppers so that the upper and lower webbings are fitted to the occupant seated on the vehicle seat, and in turn, when the vehicle door is opened, the two-way motor rotates in a clockwise direction, the moving box moves towards said front wall, and simultaneously, the moving latches release from the channeled stoppers and move towards said front wall so that the upper and lower webbings are released from the occupant seated on the vehicle seat.

5,183,291

AUTOMATIC SEAT AND SHOULDER BELT APPARATUS

Mrugesh K. Shah, 3912 Brookhaven, Pasadena, Tex. 77504

Filed Mar. 13, 1991, Ser. No. 668,762
Int. Cl.[5] B60R *22/06*
U.S. Cl. 280—804 **16 Claims**



1. Automatic seat belt and shoulder belt apparatus for helping to restrict movement of a user in a vehicle having a door, comprising:

(a) track means;

(b) seat belt means having a first end slidably disposed in the track means and a second end attached to a belt retractor means;

(c) shoulder belt means having a first end slidably disposed in the track means and a second end attached to a belt retractor means; and

(d) movement means for automatically moving the seat belt means and shoulder belt means from an inoperative position in which the seat belt means and shoulder belt means do not interfere with movement of the user to an operative position in which the seat belt means and shoulder belt means restrict movement of the user and for moving the seat belt means and shoulder belt means from the operative position to the inoperative position, including means for causing the first ends of the seat belt means and of the shoulder belt means to move within the track means, wherein

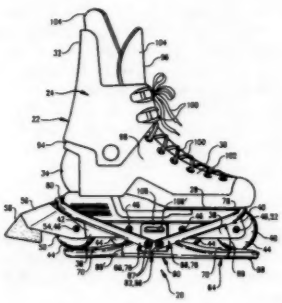
the track means comprises a substantially vertical side portion and a substantially horizontal floor portion adjacent the door of the vehicle.

5,183,292

DETACHABLE BRAKE FOR SKATE

John C. Ragin, III, P.O. Box 1316, Tempe, Ariz. 85280

Filed Jan. 17, 1992, Ser. No. 822,347
Int. Cl.[5] A63C *3/00*
U.S. Cl. 280—825 **17 Claims**



1. An apparatus for selectively securing a plurality of wheels of a skate against rotation upon an underlying support surface, the skate having a boot within which a foot of a skater may be inserted, the boot having a boot sole and a boot upper secured to the boot sole, the boot upper having a tendon guard or backstay and a heel, the skate having an elongated frame carried by the boot, the frame having a front end and a rear end, the wheels having at least a front wheel and a rear wheel, the front wheel and the rear wheel being rotatably mounted to the frame to enable each wheel to rotate about an axis, the axis of the front wheel being substantially parallel to the axis of the rear wheel, said apparatus comprising:

(a) a protective foot covering having a flexible sole and a flexible upper attached to said flexible sole, said flexible sole and said flexible upper defining an enclosure wherein the foot of the skater can be placed; and

(b) means for removably attaching said protective foot covering to the skate such that said flexible upper can be juxtaposed and urged against the wheels to restrict rotational movement of the wheels with respect to the frame, said flexible sole defining a flexible pad positioned between the wheels and the underlying support surface when said apparatus is juxtaposed against the wheels of

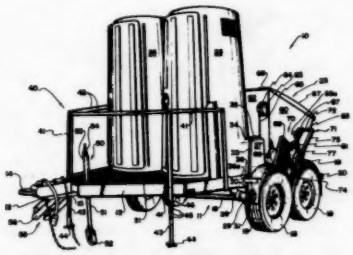
the skate, said protective foot covering defining a separate shoe or slipper when removed from the skate.

5,183,293

WASTE MANAGEMENT SYSTEM

Vincent D. Julian, 220 Crusader, Murray, Utah 84107

Filed May 23, 1991, Ser. No. 704,375
Int. Cl.[5] B60P *3/00*
U.S. Cl. 280—430 **8 Claims**



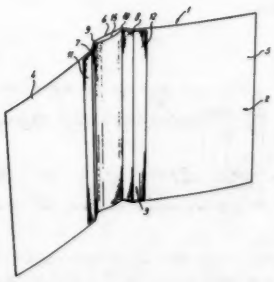
1. A waste management system comprising, a trailer having a frame with a bed covering a forward end thereof, which frame is supported on a trailer axle system whereto are journaled trailer wheels, and includes a neck as a forward trailer end with a landing gear means extending therefrom for ground engagement; means for coupling the forward end of said neck to a towing vehicle; a trash bin; means for pivotally mounting said trash bin to said trailer frame across a rear frame end to provide for trash bin rotation to a ground engaging attitude; means for maintaining the trash bin in an upright attitude relative to the trailer frame; a self contained chemical toilet; means for releasably mounting said chemical toilet onto said trailer frame; gravity drain means connected to a holding tank of said chemical toilet for draining said chemical toilet by gravity; and step means pivotally mounted to said trailer frame to pivot from a ground engaging attitude to a stowed attitude on the trailer bed.

5,183,294

PRE-ASSEMBLED SOFT COVER FOR A BOOK, AND METHOD OF MAKING THE SAME

Bero Jukola, Keuruu, Finland, and Werner Rebsamen, Rush, N.Y., assignors to Kustannusosakeyhtio Otava, Helsinki, Finland

Filed Jul. 9, 1991, Ser. No. 727,241
Claims priority, application European Pat. Off., Oct. 1, 1990, 90202614.5
Int. Cl.[5] B12D *1/00, 3/00*
U.S. Cl. 281—23 **1 Claim**



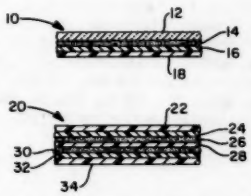
1. A pre-assembled soft cover for a book, comprising a soft sheet of book cover of a size and shape suitable to provide a front and rear cover with a spine therebetween, and adhesively secured to a central portion of said sheet a flexible firm support layer in the form of a strip bisecting said sheet and secured to said sheet only by stripes of adhesive along opposite longitudinal edges of said strip, said strip being free from securement to said sheet between said adhesively secured edges of said strip thereby to provide a spine area on said strip between said adhesively secured edges of said strip, said strip being free from securement to any pages of a book, whereby upon subsequent securement, to said spine area, of a book block with a plurality of leaves joined at their spine edges, a soft-cover book can be produced.

5,183,295

DUST COVER LAMINATE FOR BOOKS

Charles J. Barnette, Akron, Ohio, assignor to Kent Adhesive Products, Inc., Kent, Ohio

Filed Aug. 26, 1991, Ser. No. 749,861
Int. Cl.[5] B42D *3/00, 3/02*
U.S. Cl. 281—29 **4 Claims**



1. A method of protecting and affixing a dust cover to a book, comprising;

adhering a transparent protective film to a front surface of the dust cover with a pressure sensitive adhesive;

covering a back surface of the dust cover with a double backed adhesive laminate, thereby providing an adhesive coating on said back surface; and

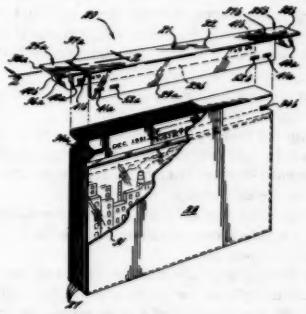
bonding said back surface of the dust cover to a hard cover of the book with said adhesive coating.

5,183,296

PHOTOGRAPH ALBUM AND METHOD FOR MAKING SAME

Stanislaw A. Policht, Closter, N.J., assignor to Qualex, Fairlawn, N.J.

Filed Sep. 17, 1991, Ser. No. 761,406
The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.
Int. Cl.[5] B42F *3/00*
U.S. Cl. 281—46 **21 Claims**



1. A photograph album comprising:

an elongate generally U-shaped binder;

a plurality of leaves for holding photographs disposed in laterally adjacent relationship to each other, each leaf having a first edge portion received within said binder, each leaf having first and second slots within and opening outwardly from respective opposite edge portions of said leaf; and

first and second retainers movably secured to said binder adjacent opposite first and second ends thereof, each of said retainers being movable between an opened position and a closed position, said retainers in the opened position permitting insertion and removal of said leaves, and said retainers in the closed position retaining said leaves within said binder by engagement within adjacent slots of said leaves.

5,183,297

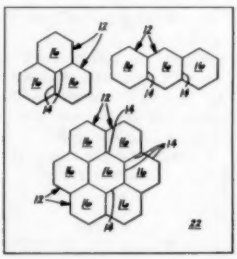
HEXAGONAL PAD

Douglas P. Bodziak, Lake Elmo; Steven L. Grovender, Woodbury; Ray A. Hunder, White Bear Lake; Robert P. Molenda, and Steven P. Roth, both of Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Division of Ser. No. 631,628, Dec. 20, 1990, which is a continuation of Ser. No. 479,841, Feb. 14, 1990, Pat. No. 5,011,186. This application Dec. 13, 1991, Ser. No. 806,492

Int. Cl.[5] B42D *15/00*

U.S. Cl. 283—67 **4 Claims**



1. A method for managing information comprising the steps of

providing a pad comprising a plurality of flexible sheets each having a peripheral edge defined by straight edge portions, a front surface adapted to be written on, a rear surface, and a coating of repositionable pressure sensitive adhesive over a portion of said rear surface releasably adhering said sheet to an underlying sheet in said pad with the straight edge portions of the peripheral edges of said sheets in alignment, said rear surface of each sheet having a portion free of adhesive to afford removal of said sheets from said pad by peeling the uppermost sheet from underlying sheets in the pad;

writing information on the front surfaces of the sheets;

removing the sheets from the pad; and

adhering the removed written on sheets to a planar surface in side by side relationship with straight edge portions of adjacent sheets in contact to represent relationships between the information on the sheets,

said providing step provides flexible sheets each having a regular hexagonal peripheral edge defined by six straight edge portions; and

said adhering step adheres the removed and written on sheets to a planar surface in side by side relationship with straight edge portions of at least one and up to six adjacent sheets in contact to represent relationships between the information on the sheets.

5,183,298

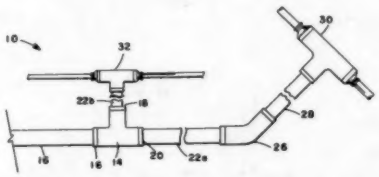
PIPE FITTING REDUCERS

Michael B. Harrington, 112 Oakwood Pl., Lynchburg, Va. 24503

Filed Apr. 24, 1991, Ser. No. 690,268

Int. Cl.[5] F16L *25/00*

U.S. Cl. 285—12 **9 Claims**



1. A pipe coupling system for a fluid handling network comprising:

a cast iron pipe fitting having a central body with first and second ends having openings therein:

said fitting having radially outwardly projecting, circumferentially-space, tabs about each of said open ends;

said tabs defining restraint lugs and being cast integrally with said fitting;

a cast iron reducer fitting having a central body with first and second ends having openings therein with said first end being larger in diameter than said second end, said body having a central tapered section between said first and second ends and a cylindrical section extending from said tapered section to said first end thereof;

said reducer fitting having radially outwardly projecting circumferentially-spaced, tabs thereabout and located adjacent the juncture of said tapered and cylindrical sections;

the tabs on said reducer fitting defining restraint lugs cast integrally therewith;

said cylindrical section of said reducer fitting being inserted into one of said open ends of said cast pipe fitting with the tabs on said cast pipe fitting and said reducer fitting being axially aligned with one another, said one end of said cast pipe fitting having a seal for sealing said cylindrical section of said reducer fitting thereto; and

means for securing the aligned lugs of said cast pipe and reducer fittings one to the other to secure said fittings to one another.

5,183,299

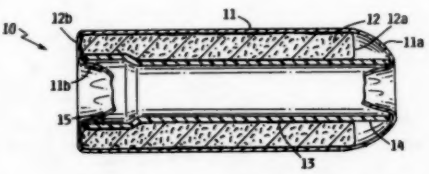
INSULATED PIPE WITH END PROTECTION

Robert Hallerstrom, Rte. 1, Box 139, Osage, Minn. 56570; Kirby Durgin, Rte. 3, Box 444, Nevis, Minn. 56467, and Wesley Benjamin, Rte. 4, Park Rapids, Minn. 56470

Filed Oct. 24, 1991, Ser. No. 781,877

Int. Cl.[5] F16L *59/00*

U.S. Cl. 285—47 **9 Claims**



1. A conduit for securing to another conduit to enable a user to construct a continuous insulated pipe using a plurality of conduits comprising:

a rigid pipe having an interior region and an exterior surface, said rigid pipe having a male end and a female end so that

said male end of said rigid pipe can be mated with a female end of another rigid pipe;

an annular insulating layer located around the exterior surface of said rigid pipe, said annular insulating layer having a first end and a second end, said first end having a shape to conform to another annular insulating layer so that when two annular insulating layers are abutted together they can be adhesively secured to each other, said annular insulating layer having sufficient crush strength so as to retain its annular shape when buried underground; and

a flexible cylindrical sleeve extending around said annular insulating layer, said flexible cylindrical sleeve frictionally held around said insulating layer, said flexible cylindrical sleeve having a first end and a second end, said first end of said flexible cylindrical sleeve projecting beyond the first end of said annular insulating layer so that said first end of said flexible cylindrical sleeve can be tucked around the first end of said annular insulating layer and into the female end of said rigid pipe to thereby keep the female end of said rigid pipe free of debris and contaminants until said rigid pipe is ready to assemble to another rigid pipe, said second end of said flexible cylindrical sleeve projecting beyond the second end of said annular insulating layer so that said second end of said flexible cylindrical sleeve can be tucked around the second end of said annular insulating layer and into the male end of said rigid pipe to thereby keep the male end of said rigid pipe free of debris and contaminants until said rigid pipe conduit is ready to assemble to another rigid pipe.

5,183,300

FASTENING FOR A MOVABLE PART OF A MOTOR VEHICLE

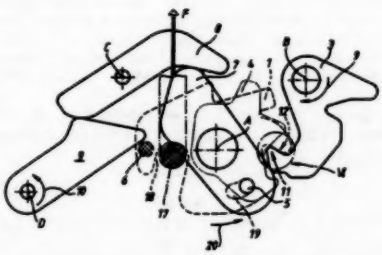
Andreas Bonné, Wimberg; Klaus Claar, Gechingen, and Jürgen Schrader, Stuttgart, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Jan. 27, 1992, Ser. No. 826,465

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1991, 4102279

Int. Cl.[5] E05C *3/26*

U.S. Cl. 292—216 **4 Claims**



1. Fastening arrangement for a movable part such as a folding top or a roof of a motor vehicle, comprising:

a rotary latch which serves for securing a fastening pin of the movable part,

an actuating device for rotating the rotary latch for a selective blocking and release of the fastening pin by the rotary latch,

a detent pawl engageable with the rotary latch, said detent pawl being rotatable oppositely to the blocking direction of the detent pawl, and,

a lever mechanism which can be activated by the actuating device and which positively guides the rotational movement, including a rotation opposite to the locking direction of the detent pawl, of the rotary latch during the operating of opening and locking the movable part.

5,183,301

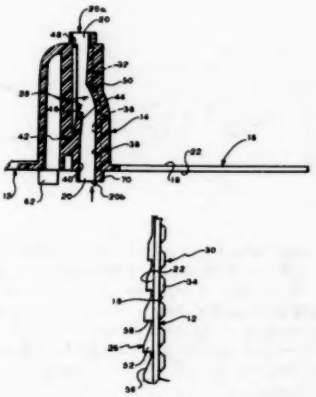
LOCKING OR SECURITY SEAL

George A. Lundberg, Jr., Bloomingdale, N.J., assignor to E. J. Brooks Co., Newark, N.J.

Filed Oct. 30, 1991, Ser. No. 785,037

Int. Cl.[5] B65D *33/34*

U.S. Cl. 292—318 **9 Claims**



1. An improved one-piece locking or security seal of the type having an elongated, flat, flexible strap integral with a housing on one end, the other end of the strap being conformally receivable in, and movable through, a passageway in the housing to form the strap into a closed loop; means, located in the passageway and on one surface of the strap, responsive to insertion of the strap without a half-twist therein into a selected end of the passageway for permitting movement of the strap out of the other end of the passageway and for preventing reverse movement of the strap; the permitting and preventing means being ineffective to prevent such reverse movement if the strap is inserted into the selected passageway end with a half-twist therein or is inserted into the other passageway end without twisting; the improvement comprising:

an elongated groove formed in and longitudinally of the passageway,

a surface feature on the other surface of the strap which is conformally received in the groove when the strap is inserted into the selected end of the passageway without twisting, the passageway interfering with and applying force to the surface feature if the strap is inserted into the selected passageway end with a half-twist or is inserted into the other passageway end without twisting, force applied to the surface feature discoloring or deforming it to provide a visual indication of improper insertion.

5,183,302

DOOR HANDLE HOUSING ATTACHMENT FOR VEHICLE DOOR

Richard Pelachyk, Utica; Lowell W. Satterlee, Clarkston; Dante C. Zuccaro, Allenton, and Timothy M. Farris, Sterling Heights, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

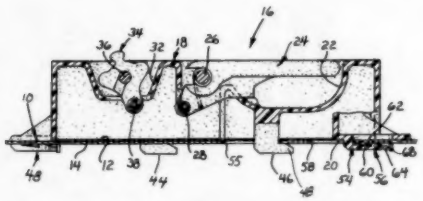
Filed Aug. 6, 1991, Ser. No. 740,737

Int. Cl.[5] E05B *3/00*

U.S. Cl. 292—336.3 **3 Claims**

1. In combination: a vehicle door panel having a surface and an underside, and a handle housing adapted for attachment on the panel, said housing being of molded plastic construction and having a base adapted to engage against the surface of the door panel and having at least one anchor leg projecting from the base, said panel having an aperture therein registering with each of the at least one anchor leg to permit the anchor leg to

pass through the panel, and the each of the at least one anchor legs having a foot adapted to engage and underlie the underside of the panel when the housing is slid longitudinally along the surface so that the foot prevents the housing from being pulled away from the panel, and said housing having at least one locking legs projecting from the base, said panel having an opening therein registering with each of the at least one locking legs to permit the locking legs to pass through the panel,



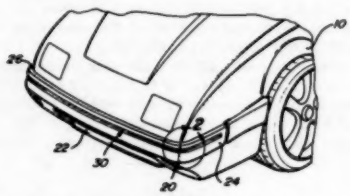
and said panel having a locking tab struck downwardly from the panel adjacent at least one of the panel openings, and at least one of the locking legs having a locking foot carried thereon and adapted to lockingly engage with the locking tab when the housing is slid longitudinally along the surface to prevent retrograde longitudinal sliding of the housing along the surface and thereby prevent the removal of the housing from the panel.

5,183,303

DECORATIVE TRIM ATTACHING METHOD

Robert A. Zoller, Bay Village, Ohio, assignor to The Standard Products Company, Cleveland, Ohio

Filed Sep. 26, 1991, Ser. No. 766,447
Int. Cl.[5] B60R *19/08*
U.S. Cl. 293—120 **11 Claims**



7. A bumper fascia comprising:

a bumper fascia molding having an elongated receiving channel integrally molded therein;

a trim strip having an outer decorative facing and an integral stem, said stem includes a damping portion, and said trim strip having an overall T shape in cross section;

said trim strip positioned in said receiving channel with said outer decorative face providing an aesthetic appearance; and

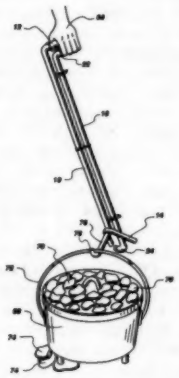
securing means for retaining said trim strip in said bumper fascia molding, said securing means being passed through the receiving channel and stem and spaced positioned on said bumper fascia molding and said stem in said channel to provide an aesthetic appearance on the outer decorative surface at attachment points.

5,183,304

APPARATUS AND METHOD FOR GRASPING AND STABLY LIFTING LIDS HAVING A HANDLE

Billie J. Mair, P.O. Box 160, Midway, Utah 84049

Continuation-in-part of Ser. No. 567,296, Aug. 14, 1990, Pat. No. 5,071,182. This application Dec. 6, 1991, Ser. No. 804,082
The portion of the term of this patent subsequent to Dec. 10, 2009, has been disclaimed.
Int. Cl.[5] A47J *45/10*
U.S. Cl. 294—10 **12 Claims**



1. An apparatus for grasping and lifting a cooking vessel having a cover with a handle and a bail comprising:

a first rod member having a first end and a second end, said first rod member having a handle for grasping formed at said first end;

a second rod member having a first end and a second end, said second rod member having a handle for grasping formed at said first end and an arcuately shaped hook formed at said second end;

means for conjoining said first rod member to said second rod member such that said second rod member is slidably adjustable in orientation to said first rod member;

means for stabilizing said cover, said means having contact means for contacting said cover at at least three points on said cover, said means for stabilizing being positioned proximate said second end of said first rod member and said contact means being extendable beyond said hook; and

grasping structure associated with said second end of one of said rod members for engaging the bail of a cooking vessel.

5,183,305

METHOD AND APPARATUS FOR HANDLING CARGO CONTAINERS

Immo R. Nordstrom, 153 Kemp Ave., Fair Haven, N.J. 07704, and Johannes A. Bak, 6706AK, Wageningen, Netherlands

Continuation of Ser. No. 451,333, Dec. 18, 1989, abandoned. This application Dec. 5, 1991, Ser. No. 809,817
Int. Cl.[5] B66C *1/10*
U.S. Cl. 294—81.2 **18 Claims**

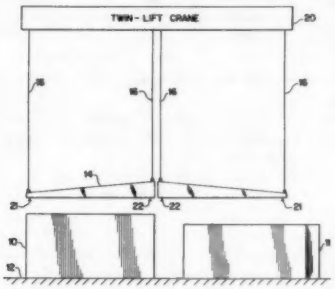
1. An apparatus for grasping and lifting cargo containers, comprising:

first and second rigid spreaders having generally rectangular bottom surfaces and substantially equal and fixed widths and lengths, the length of each of said bottom surfaces being substantially equal to a length of a cargo container of a first shorter standard size, and the sum of the lengths thereof being no greater than a length of a cargo container of a second, longer standard size;

connecting means vertically extendable from said bottom

surfaces for engaging the top of at least one cargo container, said connecting means located at adjacent ends of said spreaders being retractable to positions above said bottom surfaces;

coupling means on said spreaders for selectively latching said spreaders together end-to-end and for restraining relative movement of said spreaders in horizontal and vertical directions to form a substantially rigid unit independently of said cargo containers when the bottom surfaces of said spreaders lie substantially in a single plane, said coupling means on each of said spreaders including, at one end thereof, a plurality of housings, each of said housings having a planar end surfaced, said end surfaces on each spreader lying in substantially a single plane; and



locking means, on at least one of said spreaders, extendable from at least two of said housings thereon, at least two of the housings of the other of said spreaders including means defining openings for receiving said locking means;

whereby said first and second spreaders are rigidly coupled by said coupling means for handling one cargo container of the longer standard size and for simultaneously handling two cargo containers of the shorter standard size, but can be released by said coupling means for handling two cargo containers of the shorter standard size having different heights independently or in tandem.

5,183,306

RAIL VEHICLE WHEEL

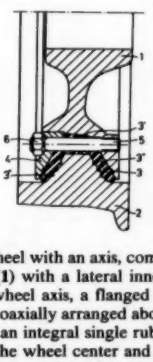
Fred S. Emilsson, Trelleborg, Sweden, assignor to SAB Wabco Holdings B.V., Sweden

Continuation of Ser. No. 802,294, Dec. 4, 1991, abandoned. This application Aug. 27, 1992, Ser. No. 933,913

Claims priority, application Sweden, Dec. 5, 1990, 9003863

Int. Cl.[5] B60B *19/00*

U.S. Cl. 295—11 **4 Claims**



1. A rail vehicle wheel with an axis, comprising in combination a wheel center (1) with a lateral inner surface coaxially arranged about the wheel axis, a flanged tire (2) also with a lateral inner surface coaxially arranged about the wheel axis, a pressure ring (4) and an integral single rubber ring (3), which is disposed between the wheel center and tire as the sole medium for diminishing circumferential creep and which is held in position by said pressure ring (4), wherein the rubber ring (3) consists of an annular, axial body (3') of substantially rectangular cross section in contact with said lateral surfaces of the wheel center and tire and disposed between the wheel center (1) and the tire (2), and said rubber ring (3) further has flanges (3'') extending outside the tire lateral surface from the rectangular cross section toward the tire to form an obtuse angle with the wheel axis.

5,183,307

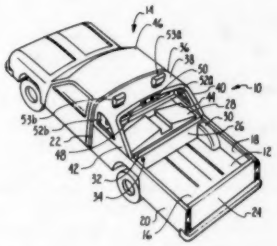
PARTITION SYSTEM FORMING A VEHICLE STORAGE COMPARTMENT

Herbert Chiu, Jr., 8830 Via Andar #16, San Diego, Calif. 92122

Filed Dec. 6, 1991, Ser. No. 804,096

Int. Cl.[5] B60R *11/00*

U.S. Cl. 296—24.1 **9 Claims**



1. A partition system providing an enclosable storage compartment in a vehicle bed, wherein said bed has first and second substantially parallel side walls, an end wall, and a floor, partition system comprising:

a partition wall substantially fixed in said bed abutting said floor and said first and second side walls and spaced a predetermined distance from said end wall to form a storage compartment defined by said side walls, end wall, floor and partition wall;

a lid spaced above said floor slidably engaging said first and second side walls, said lid slidable along said first and second side walls between an open position and a closed position, wherein said lid substantially fully encloses said storage compartment when said lid is in said closed position and further provides access to said storage compartment via an opening when said lid is in said open position;

means for guiding said lid between said open and closed positions including a first track affixed to said first side wall and a first rail fixably connected to said lid, such that said first rail is received by said first track, further wherein said guiding means is a second track affixed to said second side wall and a second rail fixably connected to said lid, such that said second rail is received by said second track; and

a fairing extending from said bed and fixably connected to said lid.

5,183,308

FOOTREST APPARATUS

Yoshitaka Koga, Kariya, and Sadao Sugiura, Anjyo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Dec. 23, 1991, Ser. No. 811,956

Claims priority, application Japan, Dec. 27, 1990, 2-415171

Int. Cl.[5] B60N *3/06*

U.S. Cl. 296—75 **4 Claims**

1. A footrest apparatus for an automotive vehicle and comprising footrest means and driving means;

said footrest means including:

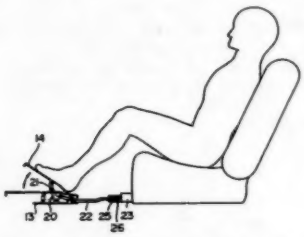
a stationary plate secured to a floor of the automotive vehicle;

a link mechanism pivotably supported on said stationary plate; and

a footrest member pivotably connected to said stationary plate and to said link mechanism;

said driving means including:

a drive source including a reduction device;



a screw turned by said drive source through the reduction device;

a nut threadedly engaged with said screw; and

an elongated rod connecting said nut and said link mechanism;

wherein said link mechanism is operated by relative movement of said nut to move said footrest member up and down, and said driving means is located to be spaced from said footrest means.

5,183,309

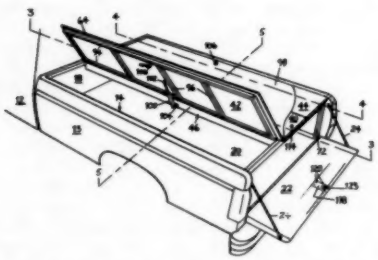
RIGID LOW PROFILE PICKUP TONNEAU

Gregory E. Jordan, 915 N. Main, Belton, Tex. 76513

Filed Sep. 24, 1991, Ser. No. 764,809

Int. Cl.[5] B60P *7/02*

U.S. Cl. 296—100 **8 Claims**



1. A cover apparatus for a rear compartment of a pickup truck or the like, said rear compartment comprising an upstanding front wall, two upstanding sidewalls, a pivotally mounted rear wall, each having a top surface, and a horizontal floor; said cover including; a rectangular center panel and two rectangular side panels longitudinally arranged along the top of said rear compartment, said center panel being substantially fixed and said side panels being pivotally attached by their inside edges to the outside edges of said center panel and being movable from a closed position to an open position to provide access to said rear compartment, a laterally extending horizontal support member, a support means at each end of said member for supporting said center panel on said bed, and a flange extending from the edges of said cover along its perimeter, said flange overlapping said top surfaces of said front wall, side walls, and rear wall.

5,183,310

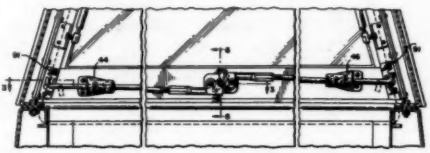
LATCHING MECHANISM FOR CAP TAILGATE DOOR

Ernie Shaughnessy, Salem, Oreg., assignor to Hunter Manufacturing Inc., Pocatello, Id.

Filed Sep. 4, 1991, Ser. No. 754,955

Int. Cl.[5] B62D *25/08*

U.S. Cl. 296—106 **15 Claims**



1. A latch assembly for a cap tailgate door, said latch assembly comprising:

rotor means mounted on the tailgate door for securing the tailgate door in a closed position after movement from an open position, and

latch plate means mounted on a frame of the cap for engagement by the rotor means in the closed position,

said rotor means including

(a) two elongated locking rods each having two ends, one end of said two rods including a bent end shaped complementary to a channel defined by the latch plate means for engagement by the bent ends in a locked position,

(b) rotator means fixedly mounted on the tailgate door for rotating said locking rods during movement from an unlocked position to the locked position, and

(c) a rotor assembly fixedly mounted on the tailgate door for moving said locking rods to the unlocked position and the locked position, the other end of said two rods being rotatably mounted on said rotor assembly.

5,183,311

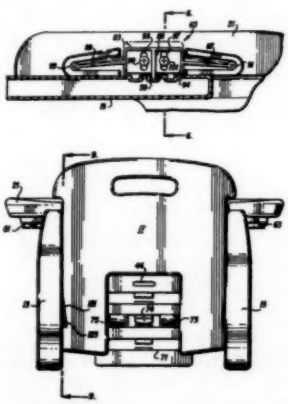
PORTABLE HIGH CHAIR/BOOSTER SEAT

Paul K. Meeker, Aurora, and William R. Gibson, Canton, both of Ohio, assignors to Lisco, Inc., Tampa, Fla.

Continuation of Ser. No. 564,249, Aug. 8, 1990, abandoned. This application Jul. 6, 1992, Ser. No. 908,960

Int. Cl.[5] A47B *83/02*

U.S. Cl. 297—151 **6 Claims**



1. Apparatus for removably attaching a tray to a chair, said apparatus comprising

a chair having a seat, back, and arms;

a plurality of slots in the outer upper portions of said arms;

a tray having a length greater than the distance between said arms of said chair;

first and second latches connected to the underside of said tray at opposite ends thereof, the distance between said latches being substantially the same as the distance between the outer upper portions of said arms of said chair, each of said latches comprising

a housing;

a substantially rigid wall secured substantially centrally within said housing and extending outwardly of said housing toward the center of said tray, said wall being of a dimension to fit within a selected one of said slots;

means for securing said housing to said tray so that said housing is slidable towards and away from the center of said tray;

a flexible arm connected to either side of said housing and extending outwardly therefrom, said flexible arms being restrained at their distal ends by said tray so as to bias said housing in the direction of the center of said tray;

whereby manual movement of each of said housings against the bias of said flexible arms allows the tray to be placed on the arms of said chair and aligned with a selected one of said slots and release of said housing to said biased position causes said wall to enter said selected slot.

5,183,312

CHILD AUTOMOBILE SEAT WITH FLANGE REVOLVING UPON ARCHED RIBS

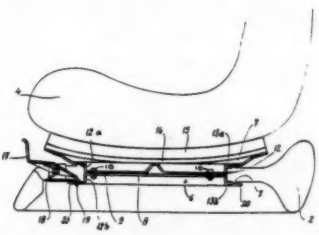
Yves Nania, Tignieu, France, assignor to Renolux

Filed Oct. 31, 1990, Ser. No. 607,105

Claims priority, application France, Oct. 31, 1989, 89 14727

Int. Cl.[5] A47C *1/08*

U.S. Cl. 297—250 **19 Claims**



1. A portable child automobile seat, for mounting on a passenger vehicle seat, comprising:

a base for removable connection to said passenger vehicle seat, said base having a wall with an opening and upper and lower faces with arced ribs adjacent said opening;

means for removably connecting said base to said passenger vehicle seat;

a swivel assembly including a hub and upper and lower flanges extending from said hub, said hub being rotatably disposed within said opening and said wall being positioned between and in direct contact with said upper and lower flanges to permit said swivel assembly to rotate relative to said base, said hub being in direct contact with an edge of said wall delimiting said opening and said upper and lower flanges being in direct contact respectively with said ribs on said upper and lower faces of said wall;

a seat body connected to said swivel assembly; and

means for removably fastening a child in said seat body.

5,183,313

TWO POSITION ADJUSTABLE PASSENGER ARRANGEMENT HAVING CAM, PLUNGER, AND PIVOTING LEVER

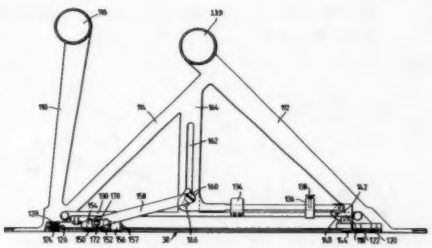
Douglas J. Cunningham, Portsmouth, England, assignor to L.A. Rumbold Limited, England

Filed Jun. 10, 1991, Ser. No. 713,112

Claims priority, application United Kingdom, Jun. 20, 1990, 9013717

Int. Cl.[5] A47C *1/02*

U.S. Cl. 297—344 **6 Claims**



1. An adjustable seating system, for use in a passenger vehicle, comprising a floor-mounted seat rail adapted to extend longitudinally through at least a portion of a passenger carrying compartment and at least three seating units mounted on said seat rail; the seat rail including a series of equally spaced interconnected openings along the length of said rail for fixedly engaging and retaining the seating units at any selected lengthwise location; at least one of the seating units including seat adjustment means comprising:

a first plunger for engaging in said rail mounted on a leg of said seating unit for vertical movement between a rail-engaging position in which said plunger engages with the rail to restrain fore and aft movement and a release position in which said first plunger permits fore and aft movement of the seating unit,

a second plunger for engaging in said rail so as to resist both fore and aft movement and vertical movement,

a lever pivotally mounted on the second plunger,

vertically extending guide means secured to the at least one seating unit,

a cam follower secured to said lever and engaging in said vertically extending guide means so as to be positionable at the bottom of the guide means either when the seating unit is in a first position in which the lever projects forwardly from the second plunger or when the seating unit is in a second position in which the lever projects rearwardly from the second plunger, the distance between these two positions being a multiple of the spacing between the opening in the rail so that the plunger can move into an engaged position when the seating unit is in either of these two positions, and

coupling means responsive to displacement of the cam follower from the bottom of the guide means to move the first plunger to the release position and adapted to return the first plunger to the rail-engaging position when the cam follower returns to the bottom of the guide means.

5,183,314

CONCEALED MECHANISM FOR DETACHABLY MOUNTING A VEHICLE SEAT

James R. Lorbiecki, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Nov. 18, 1991, Ser. No. 793,580

Int. Cl.[5] A47C *7/00*

U.S. Cl. 297—440 **8 Claims**

1. A concealed quick attach and detach mechanism for releasably installing and automatically locking a seat against

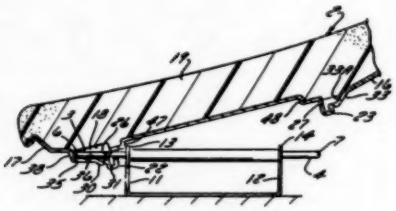
lateral movement on a vehicle of the type having spaced apart first and second cantilever supports which terminate in first and second laterally spaced free ends comprising

a seat pan having:

a housing that includes a concealed interior and a lateral support axis;

first and second spaced apart apertures in said pan housing aligned on said lateral support axis and opening into said interior for axially slidably receiving said first and second supports therethrough, respectively, when said seat is installed on the vehicle;

a deflectable first lock means in said seat pan interior in register with said support axis and laterally spaced from said first aperture;



a biasing means in said housing for normally maintaining said first lock means in said register and for permitting said first lock means to be deflected out of register with said support axis during attaching and detaching of said seat on the vehicle;

a second lock means in said seat pan interior in register with said support axis and laterally spaced from said second aperture; and

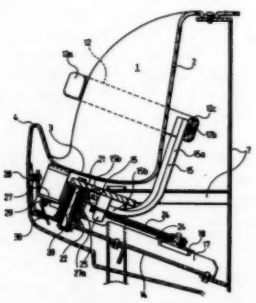
said first and second lock means being spaced apart laterally from each other a distance that is substantially equal to said lateral spacing of said free ends of the cantilever supports on the vehicle on which said seat pan is to be mounted for automatic abutment against said free ends when the seat is installed to restrain the seat against lateral movement.

5,183,315

INFANT RESTRAINING CHAIR

Takehiko Takahashi, Tokyo; Ryuji Iwata, and Yuji Shimizu, both of Aichi, all of Japan, assignors to Combi Corporation, Tokyo, Japan

Continuation of Ser. No. 568,108, Aug. 16, 1990, abandoned.
This application May 14, 1992, Ser. No. 884,046
Claims priority, application Japan, Oct. 12, 1989, 1-119520[U]
Int. Cl.[5] A47C *31/00*
U.S. Cl. 297—488 **10 Claims**



1. An infant restraining chair adapted for use with an infant having a waist and abdominal region and adapted to be positioned on a substantially level support, comprising:

a chair member having a front and a rear for seating said infant therein;

a restraining frame member which can be selectively extended and retracted from within said chair member, said frame member in a fully extended position restraining said waist and abdominal region of said infant seated in said chair member, said restraining frame member including an arcuate seat belt member having a substantially rigid construction, said arcuate seat belt member being selectively rotatable to a retracted position in which said arcuate seat belt member is substantially accommodated within said chair member, and being selectively rotatable out of said chair member to encircle and restrain said infant within said chair member; and

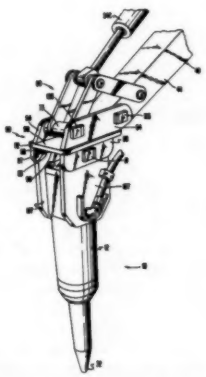
securing means for selectively securing said restraining frame member in a fully extended position, said securing means including a retraction member coupled to said arcuate seat belt member, said retraction member including means for constantly applying force to said arcuate seat belt member to bias said arcuate seat belt member toward said retracted position, said retraction member being inclined said means for constantly applying force being the mounting of said retraction member at an incline with respect to the horizontal said substantially level support to generate said force by gravity said retraction member being retractable rearwardly and downwardly.

5,183,316

MOUNTING BRACKET FOR A WORKING DEVICE

Jack B. Ottestad, La Jolla, Calif., assignor to ESCO Corporation, Portland, Oreg.

Filed Sep. 23, 1991, Ser. No. 763,551
Int. Cl.[5] E21C *3/00*
U.S. Cl. 299—69 **20 Claims**



8. A mounting bracket for mounting a working device to a carrier, said mounting bracket comprising means for attaching said bracket to a portion of said carrier for pivotal movement about a first axis and means for attaching said working device to said mounting bracket such that said working device is freely movable relative to said mounting bracket about a second pivot axis substantially parallel to said first axis throughout at least a certain range of movement.

5,183,317

TRACTION CONTROL BRAKING SYSTEM WITH A PISTON STORAGE UNIT CONNECTED TO A RESERVOIR AND PUMP

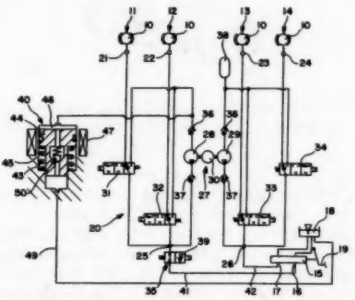
Reinhard Gutzeit, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 20, 1991, Ser. No. 702,535

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1990, 4020450

Int. Cl.[5] B60T *13/14*

U.S. Cl. 303—113.2 **9 Claims**



1. A hydraulic dual-circuit brake system for motor vehicles having vehicle wheels with wheel brake cylinders comprising an antilock system and anti-spin control system, comprising a brake pedal and a main master brake cylinder for regulating brake pressure through brake pedal activation; said main master brake cylinder comprising two separate brake circuit outputs and being connected to a brake fluid supply container; a four-duct hydro unit (**20**) including two brake circuits connected to the two brake circuit outputs; said four-duct hydro-unit comprising four outlet ducts (**21–24**) distributed in the two brake circuits and connected with the wheel brake cylinders of the vehicle wheels, at least one control valve provided for each outlet duct to regulate a wheel-spin-dependent brake pressure to the wheel brake cylinders which are connected both to an individual outlet duct and also in pars via individual connection liens to a brake circuit output of the main brake cylinder, a return pump with two separate pump elements, each of said two separate pump elements operating in one particular brake circuit to return brake fluid from the wheel brake cylinders during brake pressure reduction; an input side of each of said two pump elements being connected with said wheel brake cylinders and the outlet ducts belonging to one particular brake circuit via the control valves and connected to an output side of each of said two separate pump elements with said output side connected via one of the connection lines with the main master brake cylinder brake circuit output associated with that brake circuit, at least one device for providing a brake supply pressure during a spin control; said at least one device comprising a stop valve (**35**) in at least one connection line between one brake circuit output and the output of one of said two separate pump elements associated with a brake circuit with at least one drive wheel; said stop valve separating the at least one brake circuit from the main master brake cylinder during anti-spin control operation; at lest one piston storage unit (**40**) for supply brake fluid to said one of said two separate pump elements, said at least one piston storage unit comprising a storage piston displaceable in a storage cylinder, a drive for driving the storage piston (**44**) in axial displacement contrary to a force of a spring (**43**) and a storage chamber (**46**) defined by the storage piston; said storage chamber being directly connected to a brake fluid supply container (**18**) via a one-way relief valve (**50**), and the storage chamber (**46**) of the at least one piston storage unit (**40**) is permanently connected to the input of said one of said two separate pump elements (**28**) and that at the beginning of the anti-spin control operation, the storage piston drive (**47**) is activated to produce a storage piston stroke to fill the storage chamber (**46**) with fluid form said brake fluid supply container (**18**) whereby the force of the spring (**43**) of the piston (**44**) is moved to charge said one of said two pump elements generates a necessary brake pressure required for compensating for spinning of the wheel.

5,183,318

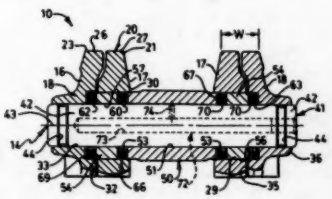
ENDLESS TRACK CHAIN FOR TRACK-TYPE VEHICLES

Morris E. Taft, Metamora; Peter W. Anderton, Peoria, and Roy L. Maguire, Edelstein, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 26, 1991, Ser. No. 797,833

Int. Cl.[5] B62D *55/092*

U.S. Cl. 305—39 **20 Claims**



1. In an endless track chain for track-type vehicles, said chain having a plurality of link sets articulately coupled in transverse relation to a longitudinal centerline of said cain by a like plurality of joints, each link set including a pair of laterally spaced, longitudinally extending links, each link having a laterally inwardly offset inboard end collar, an opposite laterally outwardly offset outboard end collar and a longitudinally disposed rail surface, said rail surface having a predetermined overall width ("W") between an inner edge and an outer edge and a full width central portion, a generally half-width outboard portion extending along said outer edge over said outboard end collar and a generally half-width inboard portion extending along said inner edge over the inboard end collar, the improvement comprising:

said inboard end collar having a first bore therethrough and extending from an inner surface of said inboard end collar to an outer surface thereof, said inner surface being offset inwardly from said inner edge of said rail surface and said outer surface being offset outwardly relative to said inboard portion of said rail surface so as to be disposed in a position substantially closer to said outer edge of said rail surface than to said inner edge thereof, said offset positioning of said inner and outer surfaces providing said first bore with a predetermined bore length ("L_1") that is greater than one-half the width ("W") of said rail surface; and

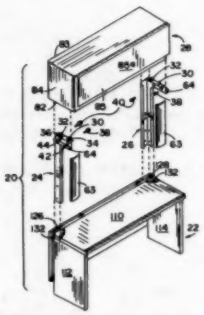
said outboard end collar having a boss extending outwardly therefrom and a second bore therethrough and extending from an inner surface of said outboard end collar to an outer surface on said boss, said inner surface being likewise offset outwardly from said inboard portion of said rail surface so as to lie outboard of the offset outer surface of the inboard end collar of a mating link in an adjoining link set of said track chain, and said outer surface on said boss being offset laterally a substantial distance from said outer edge of said rail surface to provide said second bore with a predetermined bore length ("L_2") that is at least as great as the overall width ("W") of said rail surface.

5,183,319

ADJUSTABLE SUPPORT FOR OVERHEAD FURNITURE UNITS

Alan L. Pearson, Ionia, and Richard H. Baker, Grand Rapids, both of Mich., assignors to Steelcase, Inc., Grand Rapids, Mich.

Filed Feb. 20, 1992, Ser. No. 839,126
Int. Cl.[5] A47B *17/00*
U.S. Cl. 312—196 **15 Claims**



1. A modular furniture unit, comprising:

a base unit;

at least one elongate upstanding post including a lower end engaging said base unit so that said post extends generally vertically, and further including an upper end having a laterally extending bracket, said laterally extending bracket having a forward portion and a rearward portion;

an overhead modular unit including a lower portion engaging said laterally extending bracket;

means spaced from said at least one upstanding post for supporting said overhead modular unit along with said at least one upstanding post;

leveling means located on said laterally extending bracket for adjusting the spacial orientation of said overhead modular unit relative to said base unit, said leveling means including separately adjustable first and second lift devices, said first device located on said forward portion and said second device located on said rearward portion for adjustably supporting said overhead modular unit, whereby said modular unit can be adjusted without manually lifting the overhead modular unit; and

attaching means for securely attaching said overhead modular unit to said at least one elongate upstanding post, whereby said overhead modular unit can be placed on said upstanding post, leveled, and secured to same without manipulating said upstanding post on the modular furniture unit, and whereby said overhead modular unit can be readily leveled by an installer without manually lifting and bearing the weight of the overhead unit.

5,183,320

ANTI-DESTRUCTION STRUCTURE FOR AN AUTOMATIC VENDING MACHINE

Ming-Ho Chen, No. 166, Fu-Hsing Rd., Hsin-Ying City, Tainan Hsien, Taiwan

Filed Oct. 21, 1991, Ser. No. 779,934
Int. Cl.[5] A47B *96/00*
U.S. Cl. 312—229 **6 Claims**

1. An anti-destruction structure for an automatic vending machine, the automatic vending machine including a housing having a lower end portion, the anti-destruction structure comprising:

a bottom plate disposed at said lower end portion, said bottom plate having a plurality of holes formed therethrough; and

a porous auxiliary plate fixed in said housing just above said bottom plate, said auxiliary plate having a plurality of holes formed therethrough, said holes of said auxiliary

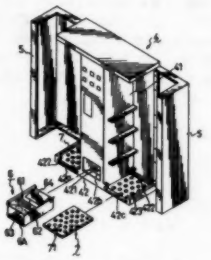


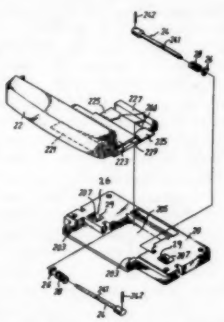
plate being communicated with and staggered relative to said holes of a corresponding portion of said bottom plate.

5,183,321

HAND BRAKE MECHANISM FOR A CENTRAL PROCESSING UNIT CABINET

Christian C. Landry, 224 Old Littleton Rd., Harvard, Mass. 01451; Jause Kuo, 255, Jen-Ho Road, Sec. 2, Tachi, Taoyuan, Taiwan; Ching-Shi Chen, 255, Jen-Ho Road Sec. 2, Tachi, Taoyuan, Taiwan, and William Wu, 255, Jen-Ho Road, Sec. 2, Tachi, Taoyuan, Taiwan

Filed Jun. 20, 1991, Ser. No. 718,497
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—250 **8 Claims**



1. A hand brake mechanism for a cabinet mounted on wheels for movement, comprising:

a base having a groove (**205**) substantially formed in the central part thereof, said base being fixed to the bottom of said cabinet and located generally between two of said wheels provided on the bottom of said cabinet each side of said base having lateral holes extending therethrough for receiving

an engaging rod having one end protruded outside said base capable of engaging said wheels in a fixed position and the other end having a guide pin thereon protruded over said groove (**205**);

a slidable handle having an extension part mounted on said groove (**205**), said handle slidable in a direction perpendicular to a central axis of said engaging rods;

a pair of guide plates mounted in said groove (**205**) and formed separately on the outer edges of said extension part, respectively, each of said guide plates having obliquely angled inner edges with respect to said central axis of said engaging rods, and each of said guide plates having ends being connected by a connecting bar, and said guide pins of said engaging rods capable of sliding along said inner edges of said guide plates,

said guide plates when moved by pulling on said handle causing said guide pins to slide along said inner edges of said guide plates enabling the disengagement of said engaging rods from said wheels;

said guide plates when moved by pushing said handle causing said guide pins to slide along said inner edges of said guide plates enabling the engagement of said engaging rods with said wheels.

5,183,322

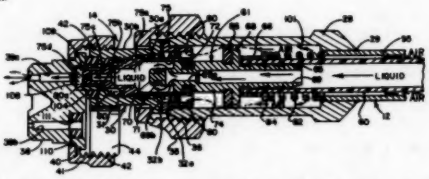
SPRAY GUN WITH SELECTIVE HYDRAULIC AND AIR ASSISTED OPERATING MODES

James Haruch, Naperville, Ill., assignor to Spraying Systems Co., Wheaton, Ill.

Filed Apr. 19, 1991, Ser. No. 688,907

Int. Cl.[5] B05B *7/12, 9/01, 1/16*

U.S. Cl. 239—394 **45 Claims**



1. A hand-held spray gun comprising a handle section having a liquid inlet, a nozzle section mounted forwardly of said handle section and having a discharge orifice, said nozzle section including a nozzle housing and a valve follower, liquid conduit means connected to said valve follower and extending to said handle section for communicating liquid from said inlet to said nozzle section, a trigger mounted on said handle section for movement between actuating and deactuating positions, said trigger being operatively coupled to said liquid conduit means such that upon movement of said trigger from said deactuating to said actuating positions said liquid conduit means and the valve follower connected thereto are moved from a first position in which said valve follower prevents the flow of liquid through said nozzle section discharge orifice to a second position which permits the flow of liquid from said liquid inlet and through said liquid conduit means and nozzle section discharge orifice.

5,183,323

FLAT PANEL ILLUMINATION SYSTEM

Maurice Daniel, 3115 King St., Alexandria, Va. 22302

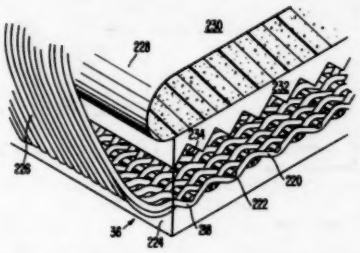
Division of Ser. No. 105,829, Oct. 8, 1987, Pat. No. 5,021,928, which is a continuation-in-part of Ser. No. 731,511, May 5, 1985, Pat. No. 4,715,700, which is a division of Ser. No. 427,155, Sep. 29, 1982, Pat. No. 4,519,017. This application Mar. 27, 1991, Ser. No. 675,944

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] F21V *8/00*

U.S. Cl. 362—32 **50 Claims**

1. A flat panel illumination system comprising light source means, light conducting cable means to conduct light from said light source means; and light emitting panel means connected to receive light conducted by said light conducting cable means, said light emitting panel means including a light emitting fabric means woven from light conducting fiber means, said light conducting fiber means being formed of multi-mode optical light conducting fibers which emit light conducted thereby due to the bending of said light conducting fibers woven in said light emitting fabric means, said light conducting fiber means extending in unwoven form outwardly from at least a first side of said light emitting fabric means, said light conducting fiber means being woven with spaced fill threads to form said light emitting fabric means, the spacing between said



fill threads in said light emitting fabric means being progressively decreased as the distance from said first side increases.

5,183,324

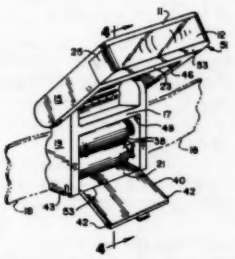
LIGHTING ACCESSORY

Roy Thomas, 6808 S. May, Chicago, Ill. 60621

Filed Sep. 5, 1991, Ser. No. 755,548

Int. Cl.[5] F21L *15/08*

U.S. Cl. 362—103 **7 Claims**



1. A lighting accessory, which may be worn by an individual, comprising:

a. a stationary housing member having a horizontal hinge means at one end thereof;

b. a rotating housing member having a corresponding horizontal hinge means at one end thereof,

said stationary housing member and said rotating housing member, forming a housing unit, being arranged and adapted to being hingedly connected together and said hinge connection having a resistance means with sufficient frictional resistance to support the weight of the rotating housing member in a plurality of rotational positions relative to the stationary housing member, the rotating housing member may be positioned in front of and in alignment with said stationary housing member to form a closed housing unit,

said closed housing unit being suitably sized and adapted to contain an electrical circuit comprising a power source and power source retaining means, a light source and light source retaining means, and a switch means;

c. an electrical power source operably connected to a power source retaining means;

d. an electrically power light source and light source retaining means mounted on the rotating housing member at the end opposite its hinge means and having the light emissions of said light source directed away from and perpendicular to a horizontal hinge means axis; and

e. a switch means to engage and disengage the light source and the power source,

whereby, the rotating housing member may be pivotally rotated about the horizontal hinge means axis relative to

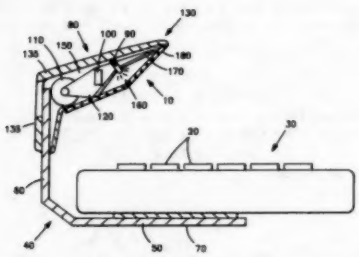
said stationary housing member to variably direct the light emissions along an arc of approximately 180 degrees.

5,183,325

ILLUMINATION APPARATUS FOR REMOTE CONTROL DEVICE

Terry D. Hurdle, Newport Beach, Calif., assignor to D. T. Hurdle, Newport Beach, Calif.

Filed Oct. 9, 1990, Ser. No. 594,834
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—109 **3 Claims**



1. An apparatus for illuminating the operating elements of a remote control device, the remote control device being of the type having operating elements, and having a window for transmission of a signal, and having a generally flat bottom surface, the apparatus comprising:

an "L" shaped bracket made of a material transparent to the signal, the bracket having a first and a second legs, the legs being of different lengths and joined at an approximate right angle;

a means of illumination contained in;

an enclosure, the enclosure having means for mounting the enclosure onto the end of either the first or the second leg;

a means of attachment for connecting either the first or the second leg to the flat bottom surface of the remote control device, the alternate leg extending upwardly parallel to the window for transmission, the enclosure being supported by the alternate leg at a position above the operating elements in order to provide illumination to the elements, whereby

either leg may be used to hold the enclosure thereby providing two alternate elevations of the enclosure above the remote control.

5,183,326

UNDERWATER FLASHLIGHT HOLDER

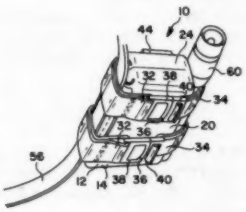
Richard N. Case, Boulder, Colo., assignor to RCP Enterprises, Inc., Boulder, Colo.

Filed Feb. 25, 1992, Ser. No. 842,016
Int. Cl.[5] F21L *7/00*
U.S. Cl. 362—191 **20 Claims**

1. An apparatus for holding a flashlight adjacent to the side of the head gear of a diver, said apparatus comprising:

means for providing support and floatation to a flashlight, said flashlight support and floatation means having a proximal side adapted to be held adjacent to the head gear of a diver, and a distal side which is spaced from and opposed to said proximal side;

means for releasably engaging and securing a flashlight to said flashlight support and floatation means; and



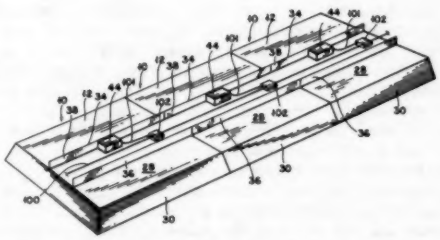
means for releasably engaging and securing said flashlight support and floatation means to the head gear of a diver.

5,183,327

FLUORESCENT LIGHT FIXTURE WITH OPEN BALLAST HOUSING

William Fabbri, Billerica, Mass., assignor to Keene Corporation, Union, N.J.

Filed Sep. 10, 1991, Ser. No. 757,217
Int. Cl.[5] F21S *3/00*
U.S. Cl. 362—219 **9 Claims**



1. In a fluorescent light fixture of the type comprising a body, a ballast assembly engaging said body and bulb-engaging sockets in electrical communication with said ballast assembly, the improvement comprising an assembly housing including sidewalls extending substantially along a longitudinal length of said body whereby when a plurality of fluorescent light fixtures are sequentially placed end-on-end a common channel extending along a length of the plurality of fluorescent light fixtures is formed by said sidewalls for receiving a common electrical power line longitudinally therein, and a removable cover engaging upper portions of said sidewalls thereby providing access to said common channel.

5,183,328

LUMINAIRE HAVING AN IMPROVED THERMAL MANAGEMENT ARRANGEMENT

Mitchell M. Osteen, Zirconia, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 9, 1991, Ser. No. 805,249
Int. Cl.[5] F21V *29/00*
U.S. Cl. 362—294 **14 Claims**

1. A lighting fixture comprising:

a fixture support member;

a high intensity light source connected to said support member;

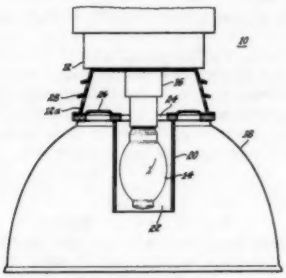
means for energizing said light source, said energizing means being connected to said support member;

reflector member connected to said support member and being disposed at least partially around said light source so as to direct the light output of said light source in a prede-

termined pattern, said reflector member having at least one opening formed therein;

a sleeve member connected to said support member and being disposed in at least a partially surrounding manner to said light source and at a position between said reflector member and said light source;

wherein said sleeve member is constructed of a light transmissive material and has an opening formed at the upper end thereof, said sleeve member being effective such that a portion of the heat generated by said light source can be



channeled through said sleeve member opening and away from said reflector member thereby; and,

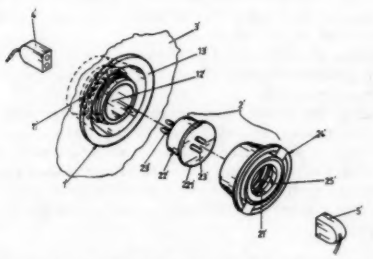
wherein said opening of said sleeve member is smaller in size relative to said at least one reflector opening, said sleeve member opening and said reflector member opening being disposed relative to one another such that a space exists therebetween, said space being effective such that an air flow can occur between said reflector member and said sleeve member, such air flow travelling through said space.

5,183,329

ELECTRIC COUPLER FOR A LIGHTED INFLATABLE DEVICE

Henry Chen, 5F, No. 25, Lane 15, Hsingyun Street, Neihu, Taipei, Taiwan

Filed Aug. 15, 1991, Ser. No. 745,559
Int. Cl.[5] F21V *1/06, 33/00*
U.S. Cl. 362—352 **2 Claims**



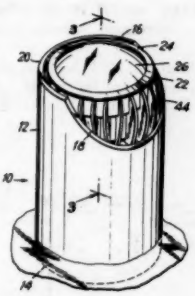
1. For a lighted inflatable device, an electric coupler comprising a base heat sealed to the inside of a lighted inflatable device, said base having a passage way defined therein for inserting a light string inside said lighted inflatable device, and a sealing device fastened in said base, wherein said sealing device being comprised of an insert releasably inserted in said base to air-tightly block up said passage way, said insert having terminals for connecting an external power supply to the light string inserted inside said lighted inflatable device by connectors, and a lock nut fastened in said base through a screw joint to tightly secure said insert in place.

5,183,330

LIGHTING FIXTURE WITH LAMP HOLDER INCLUDING INTEGRAL RESILIENT FINS

Michael Rishel; Larry Powers, both of Hanover, Pa., and Claude Barozzini, Annandale, N.J., assignors to The Genlyte Group Incorporated, Secaucus, N.J.

Filed Jul. 11, 1991, Ser. No. 728,591
Int. Cl.[5] F21V *21/14*
U.S. Cl. 362—372 **25 Claims**



1. A lighting fixture including;

a lamp holder;

a cylindrical body into which said lamp holder is inserted;

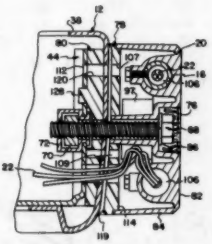
said lamp holder including bulb engaging means; electrical power receiving means; and axial and rotational positioning means on an exterior of said lamp holder frictionally engaging said cylindrical body, whereby said frictional engagement is such that when said cylindrical body is in a final position said lamp holder is adjustably retained by said cylindrical body so as to allow for axial and rotational movement thereof.

5,183,331

CANTILEVERED SPOKE MOUNTING FOR LIGHTING FIXTURE

James E. Edgell, Roanoke, and David L. Jordan, Boones Mill, both of Va., assignors to Hubbell Incorporated, Orange, Conn.

Filed Jul. 3, 1991, Ser. No. 725,485
Int. Cl.[5] F21M *3/18*
U.S. Cl. 362—426 **29 Claims**



1. An adjustable mounting assembly for a lighting fixture, comprising:

at least one support member;

wiring means extending through said support member for electrically coupling the fixture to a power source;

at least one casing having a fastening sleeve and having at least one conduit receiving said support member and said wiring means, said casing being rotatable with respect to the fixture;

spacer means for spacing said casing from the fixture, said

spacer means having a bore and having an aperture receiving said wiring means; and

fastener means, extending through said fastening sleeve and said bore, for adjustably and rotatably coupling said casing and said spacer means to the fixture and releasably retaining the fixture in selected rotational positions relative to said casing and support member, said fastener means being independent from said casing.

5,183,332

KNEADING METHOD OF CONCRETE

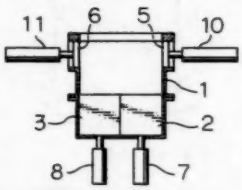
Kenji Maeda, 4-7, Matsunoki 3-chome, Suginami-ku, Tokyo, Japan

Filed Jul. 18, 1991, Ser. No. 732,075

Claims priority, application Japan, Mar. 26, 1991, 3-86128

Int. Cl.[5] B28C *5/00, 5/48*

U.S. Cl. 366—2 **4 Claims**



1. A kneading method, comprising the steps of:

a. providing a layer of concrete material in a kneading tank;

b. dividing said layer of concrete material in said kneading tank into a plurality of layer sections arrayed side by side in a right-and-left direction;

c. laying one of said layer sections on another of said layer sections;

d. compressing said laid layer sections of said concrete material in an up-and-down direction until said concrete material spreads out substantially wider than said laid layer sections; and

e. performing said steps (b) through (d) repeatedly.

5,183,333

PRINTER SYSTEM FOR SELECTIVE PRINTING ON FIRST AND SECOND PRINT MEDIA LOCATED IN SEPARATE PRINT ZONES

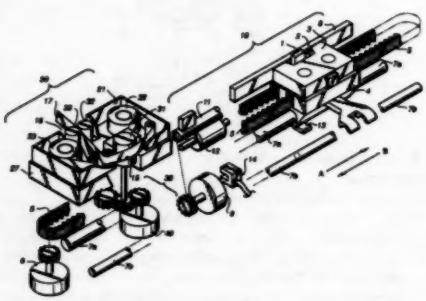
Masahiro Minowa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 10, 1991, Ser. No. 683,468

Claims priority, application Japan, Apr. 11, 1990, 2-96023; Apr. 24, 1990, 2-108041; May 7, 1990, 2-117178

Int. Cl.[5] B41J *11/52*

U.S. Cl. 400—605 **17 Claims**



1. A system for printing, comprising:

means to print indicia selectively on a first or a second printing media respectively comprising a linear strip form and a sheet form, said print means including a single carriage having a print head and inking means, transport means to move said carriage along a path of travel between a first zone for printing on said first printing media and a second zone for printing on said second printing media,

said print means having a first printing mode for holding said carriage in a stationary position for printing on said first printing media at said first zone as said first printing media is moved relative to said print head and a second printing mode for providing reciprocal motion to said carriage for printing on said second printing media at said second zone as said print head is moved relative to said second printing media;

means in said path of travel to determine if said carriage is in said first print zone or is in said second print zone,

control means responsive to said carriage determining means to transport said carriage to either said first print zone or said second print zone depending upon whether said first or second printing mode has been selected.

5,183,334

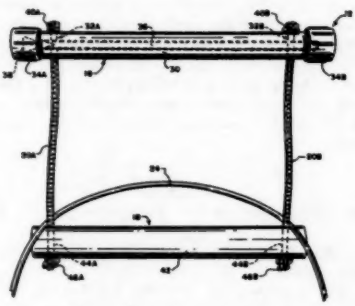
PAINT CAN SHAKER

Dewey F. Geistlinger, Box 154, Rte. 1, DeWitt, Nebr. 68341

Filed Apr. 8, 1991, Ser. No. 681,976

Int. Cl.[5] B01F *15/00*

U.S. Cl. 366—129 **8 Claims**



1. A method of mixing paint comprising the steps of:

inserting a container holder of a paint mixer into a handle of a can of paint wherein the handle is connected to the can of paint at pivot points located along an axis extending through the can of paint;

gripping a handle of the paint mixer;

lifting the paint mixer whereby an elongated flexible member is extended;

holding the paint mixer wherein a user's arm holding the paint mixer is extended downwardly; and

moving the paint mixer in a manner to cause the can of paint to mix rapidly wherein the can of paint follows a partial orbital path about the user's shoulder causing the can of paint to rotate about the axis extending through the can of paint.

5,183,335

HYDRAULIC JET FLASH MIXER WITH FLOW DEFLECTOR

John S. Lang, Arcadia; R. Rhodes Trussell, Pasadena, and Susumu Kawamura, San Gabriel, all of Calif., assignors to James M. Montgomery Engineers, Inc., Pasadena, Calif.

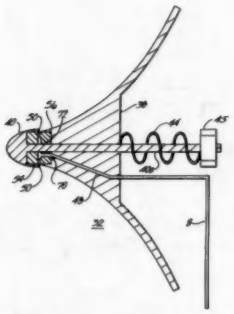
Filed Feb. 4, 1991, Ser. No. 650,770

Int. Cl.[5] B01F *5/18, 5/04*

U.S. Cl. 366—174 **31 Claims**

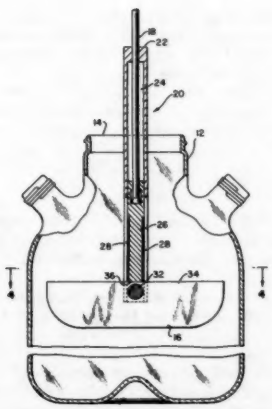
1. Apparatus for injecting and mixing coagulant into a liquid stream by flash mixing comprising:

a) a conduit for carrying the liquid stream without coagulant in a first direction;
b) injection means having an outlet for injecting a fluid jet stream into the liquid stream;
c) means for drawing off a portion of the liquid stream from a predetermined position along the conduit and for supplying the drawn-off portion to the injection means to form the fluid jet stream;
d) a deflector disposed proximate to and downstream of the outlet for deflecting the fluid jet stream in a second direction transverse to the first direction of the liquid stream; and



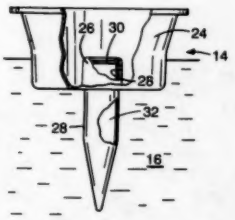
e) means for introducing coagulant directly into the fluid jet stream downstream of the outlet of the injection means for injecting such that the coagulant is carried by the fluid jet stream which is deflected in the second direction for mixing into the liquid stream, wherein the predetermined position is upstream of the means for introducing, such that conduit is adapted for carrying the liquid stream with the coagulant mixed therein away from the means for introducing and the deflector, thereby avoiding backmixing.

5,183,336
STIRRING ASSEMBLY
Jeffrey P. Poltorak, and Omar A. Swift, both of Vineland, N.J., assignors to Kontes Glass Company, Vineland, N.J.
Filed Jan. 21, 1992, Ser. No. 822,869
Int. Cl.[5] B01F *13/08*
U.S. Cl. 366—273 **9 Claims**



1. A stirrer assembly for use in a container or the like having an entrance opening, said assembly comprising a rod, plunger means operably connected to one end of said rod, support means comprising a tubular portion defining a recess into which said plunger means is received for movement between first and second positions as said rod is moved relative to said support means between an extended position and a retracted position, first and second spaced elements extending from said tubular portion, a unitary blade, means for mounting said blade between said elements for pivotal movement relative to said support means, said blade having an edge, said plunger means cooperating with said blade edge and being effective to move said blade from a position in which said blade can pass through the container entrance toward a position suitable for stirring, as said plunger means is moved toward said second position.

5,183,337
THERMOMETER CALIBRATION
Francesco Pompei, Boston, Mass., assignor to Exergen Corporation, Newton, Mass.
Filed Jul. 8, 1991, Ser. No. 726,817
Int. Cl.[5] G01K *15/00*
U.S. Cl. 374—2 **8 Claims**



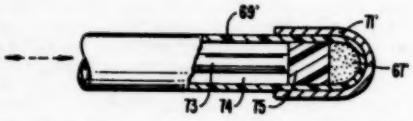
1. A black body for calibrating an infrared thermometer, comprising:
a cavity, and
a support connected to the cavity and providing an opening into the cavity,
wherein said support and said cavity are structured to define means for causing the black body to float freely and stably on a surface of a volume of liquid with the cavity in close thermal contact with the liquid and the opening accessible from above the surface.

8. A method of calibrating an infrared thermometer comprising
floating a black body cavity freely on a surface of a volume of liquid at a known temperature with an opening to the cavity accessible from above the sufrace of the liquid, and using the thermometer to measure the temperature inside the black body cavity via the opening, said temperature being used to calibrate said thermometer.

5,183,338
TEMPERATURE MEASUREMENT WITH COMBINED PHOTO-LUMINESCENT AND BLACK BODY SENSING TECHNIQUES
Kenneth A. Wickersheim, Menlo Park, Calif., and Bruce E. Adams, Portland, Oreg., assignors to Luxtron Corporation, Campbell, Calif.
Division of Ser. No. 683,258, Apr. 10, 1991, Pat. No. 5,112,137. This application Dec. 13, 1991, Ser. No. 808,012
Int. Cl.[5] G01K *11/20*; G01J *5/08*
U.S. Cl. 374—131 **6 Claims**

1. An optical temperature measuring sensor, comprising:
an elongated substantially optically transparent light pipe,
a black body cavity held adjacent one end of the light pipe and adapted to send temperature dependent optical emissions thereof along said light pipe, and

a quantity of photoluminescent material held adjacent said one light pipe end and adapted to send, when excitation



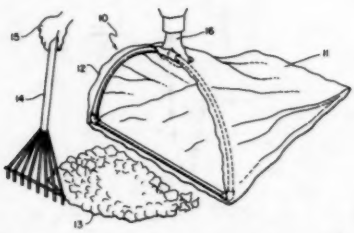
radiation is directed thereagainst along said light pipe, temperature dependent optical emissions thereof along said light pipe.

5,183,339

BAG AND ADJUSTABLE BAG OPENER FRAME

Willard J. Williams, P.O. Box 1809, Wilmington, Calif. 90744

Filed Feb. 24, 1992, Ser. No. 840,018
Int. Cl.[5] B65D *33/02*
U.S. Cl. 383—33 **1 Claim**



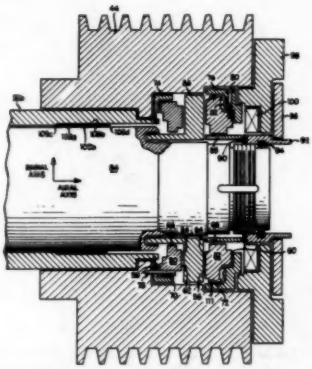
1. A trash bag and adjustable bas opener frame comprising:
an elongated rigid linear base having opposite ends;
a curvilinear member having opposite ends with at least one of said member ends secured with a selected one of said base ends;
said member having an outwardly projecting bias normally urging said member away from said base;
said member includes a pair of member portions wherein each portion is secured to an end of said base opposite ends and further provided with opposing terminating ends;
coupling means cooperatively carried on said member portion terminating ends releasably joining said terminating ends together;
elbow joints securing said member opposite ends with said base opposite ends;
said trash bag having an open entrance leading to an internal storage area;
said base and said member portions constituting a frame insertable into said bag entrance and engageable with said bag entrance to maintain said entrance open;
said bag includes an edge marginal region defining said entrance against which said frame bears in response to said normal bias;
adjustment means including telescoping sliding relationship of said member opposite ends operable in combination with said coupling means to selectively establish the length of said member; and
said coupling means includes spaced segments and a manual clamp moveable over said segments between a closed and an open position to alternately tighten and release said member portion terminating ends with respect to each other.

5,183,340

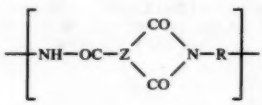
BEARING AND BEARING ASSEMBLY

Jeff A. Higginbotham, Highlands; George Garcia, Texas City, and Robert L. Richards, Dickenson, all of Tex., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 833,336, Feb. 10, 1992, abandoned, which is a continuation of Ser. No. 548,718, Sep. 19, 1990, abandoned. This application Jun. 12, 1992, Ser. No. 898,931
Int. Cl.[5] F16C *17/04, 33/20*
U.S. Cl. 384—420 **16 Claims**



1. A bearing comprising:
a first side in alignment with a radial axis and a second side opposite said first side;
said first side including bumper means for withstanding thrust, extending outwardly therefrom comprising a substantially flat surface; and
an inner-axial surface in alignment with an axial axis and an outer-axial surface opposite said inner-axial surface
wherein said bearing comprises a thermoplastic, amide-imide resinous material comprising at least one recurring unit of the following moieties:



wherein one carbonyl group is meta to and one carbonyl group is para to each amide group and wherein Z is a trivalent benzene ring or lower alkyl-substituted trivalent benzene ring, R comprises one or more wholly- or largely-aromatic hydrocarbon radicals of from 6 to about 10 carbon atoms or two divalent aromatic hydrocarbon radicals of from 6 to about 10 atoms joined directly or by stable linkages selected from the group consisting of —O—, methylene, —CO—, SO_2—, and —S—.

5,183,341

SPEED SENSING BEARING UNIT

Hideo Ouchi, Sagamihara, and Hiroya Miyazaki, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1992, Ser. No. 862,644
Claims priority, application Japan, Apr. 3, 1991, 3-029364[U]
Int. Cl.[5] F16C *41/00*
U.S. Cl. 384—446 **1 Claim**

1. A speed sensing bearing unit comprising:
a fixed ring having an inner peripheral surface and a pair of outer ring raceways formed on said inner peripheral surface,

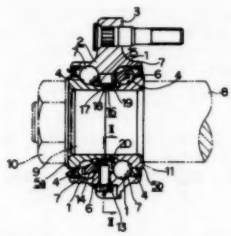
a pair of rotatable inner rings each having an outer peripheral surface and an inner ring raceway formed on said outer peripheral surface corresponding to said outer ring raceways, respectively,

a plurality of rolling bodies provided between said outer ring raceways of said fixed ring and said inner ring raceways of said inner rings, respectively,

a pulse rotor supported on one of said pair of inner rings and having an outer peripheral surface,

a sensor supported by said outer ring between said outer ring raceways to oppose the outer peripheral surface of said pulse rotor,

said pulse rotor comprising a cylindrical main body of magnetic material having a plurality of through-apertures at evenly spaced intervals in a circumferential direction, and an engaging element of a non-magnetic resilient material formed to be fitted into said through-apertures, and



said inner rings having axial end portions facing to each other with said pulse rotor fitted over said axial end portion of one of said inner rings,

the other of said inner rings having grooves formed in said axial end portion thereof on the outer peripheral surface thereof,

said engaging element having an inner peripheral surface and hook portions protruding from said inner peripheral surface to engage with said grooves formed on said outer peripheral surface of the outer of said inner rings.

5,183,342

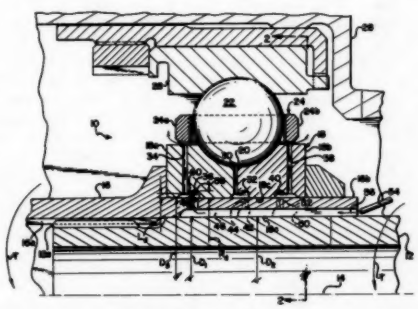
LUBRICATED BEARING ASSEMBLY

Paul C. Daiber, Cincinnati; Anthony P. Greenwood, Mason, both of Ohio, and Ted E. Bailey, Ann Arbor, Mich., assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 16, 1991, Ser. No. 807,339

Int. Cl.[5] F16C *33/06, 33/60*

U.S. Cl. 384—475 **6 Claims**



1. A bearing assembly comprising:

an input shaft for transmitting torque, and having an axial centerline axis;

an output shaft operatively joined coaxially to said input shaft for receiving said torque, said output shaft having a distal end disposed circumferentially on said output shaft;

an annular bearing split inner race fixedly joined on said output shaft distal end for rotation therewith, said inner race including first and second halves joined together at a radial splitline;

a plurality of bearing elements disposed circumferentially around said inner race;

an annular cage joined to said bearing elements to maintain a predetermined circumferential spacing therebetween and including first and second axially spaced apart ends spaced radially above said inner race first and second halves, respectively;

a stationary outer race surrounding said bearing elements;

said inner race including a plural number A_1 of circumferentially spaced splitline channels extending radially therethrough at said splitline in flow communication with a circumferentially extending splitline manifold defined between said inner race and said output shaft distal end;

said inner race first half including a plural number B_1 of circumferentially spaced first channels extending radially therethrough below said cage first end in flow communication with a circumferentially extending first manifold defined between said inner race first half and said output shaft distal end;

said output shaft distal end including:

a number A_2 of circumferentially spaced, axially extending splitline feed grooves disposed in an inner surface thereof and joined in flow communication with a respective number of splitline feed holes extending radially through said output shaft distal end for channeling oil to said splitline manifold;

a number B_2 of circumferentially spaced, axially extending first-manifold feed grooves disposed in said inner surface between said splitline feed grooves and in flow communication with a respective number of first-manifold feed holes extending radially through said output shaft distal end for channeling oil axially over said splitline to said first manifold; and said number A_2 being less than A_1, and said number B_2 being less than B_1.

5,183,343

METHOD OF PRINTING BAR CODES BY A BAR CODE PRINTER

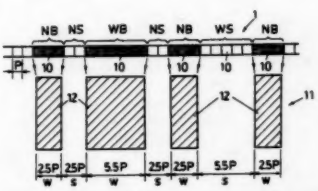
Shigeru Tazawa, and Yutaka Shibata, both of Miyagi, Japan, assignors to Tohoku Ricoh Co., Ltd., Miyagi, Japan

Filed Jun. 11, 1992, Ser. No. 897,052

Claims priority, application Japan, Jun. 12, 1991, 3-167719

Int. Cl.[5] B41J *5/00*

U.S. Cl. 400—103 **1 Claim**



1. A method of printing bar codes by a bar code printer having a line thermal head with a number of heating elements arrayed at a specified pitch P; by allocating n+1 pieces of heating element to sections corresponding to bars in a bar code, and n pieces of heating elements to sections corresponding to spaces in the bar code (n: a positive integer in both cases), and selectively heating the heating elements allocated to sections corresponding to the aforesaid bars by means of controlling a quantity of energy to be loaded to the aforesaid thermal line head to print bar codes, each consisting of bars

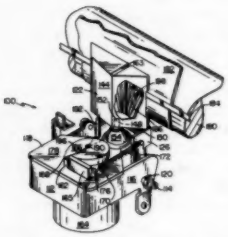
and spaces having the width of (n+0.5) P, by transferring ink on a plastics-based thermal transfer ink ribbon to paper.

5,183,344

QUIET IMPACT PRINTER MECHANISM

Stephen M. Pawlak, Cortland; Roger J. Rimbey, Spencer, and Mark D. Rodee, Groton, all of N.Y., assignors to Smith Corona Corporation

Filed May 31, 1991, Ser. No. 708,554
Int. Cl.[5] B41J *7/34, 7/30*
U.S. Cl. 400—160 **18 Claims**



1. An impact printer mechanism for driving a selected character pad of a print element to print a character on a sheet medium supported by a platen, the mechanism comprising:

a print hammer including a mass weight which supports a mounted anvil thereon, said mass weight includes a plate having a surface projecting a plurality of letter spaces in a plane parallel to said platen and includes having a maximum dimension in a direction perpendicular to said platen substantially behind said anvil; and

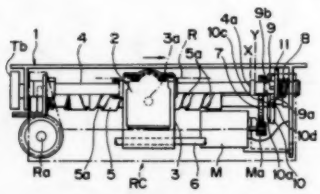
a drive means comprising a rotary cam operatively connected to said print hammer for actuating said print hammer to cause printing, said drive means including cam controlled means for imparting impact velocity to said print hammer.

5,183,345

TWO-COLOR SHIFTING DEVICE FOR PRINTING RIBBON

Masato Suzuki, Yokohama, Japan, assignor to Amano Corporation, Japan

Filed Jun. 26, 1992, Ser. No. 904,695
Claims priority, application Japan, Jun. 27, 1991, 3-057683
Int. Cl.[5] B41J *33/54*
U.S. Cl. 400—211 **1 Claim**



1. A two-color shifting device for a printing ribbon, in which when a notched pinion provided with feed gear and intermittent feed gear formed alternately thereon in a circumferential direction thereof is pushed by a printer in order to be moved to a two-color shifting position against a compression spring, a two-piece gear formed on a feed wheel to be rotated by a motor is brought into mesh with said feed gear and intermittent feed gear in turn, respectively, to cause said notched pinion to make a feed-rotation, so that a switch cam formed on said notched pinion switches a ribbon cassette between an upper position and a lower position to effect a two-color shifting, wherein said two-color shifting device for printing ribbon is characterized by:

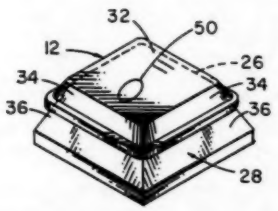
said feed gear and intermittent gear axially spacedly arranged alternately on the peripheral surface of said notched pinion, a two-piece gear formed of a notched gear meshable with said feed gear and an intermittent gear meshable with said intermittent notched gear being arranged on both front and rear sides of the peripheral surface of said feed wheel, with a mesh-prevention side thinner than a distance between said feed gear and said intermittent feed gear being left at a center thereof, when a normal printing is effected, said feed gear being in contact with said mesh-prevention side to prevent the feed gear from meshing with said notched gear, however, when said notched pinion is moved to said two-color shifting position, said feed gear and intermittent feed gear being brought into mesh with said notched gear and intermittent gear, respectively, so that said notched pinion makes a feed-rotation.

5,183,346

KEYCAP OVERLAY SNAP-ON SYSTEM

Herbert Tesar, 3382 Capital Circle NE., Tallahassee, Fla. 32308

Filed May 15, 1992, Ser. No. 883,530
Int. Cl.[5] B41J *5/08, 5/10*
U.S. Cl. 400—490 **8 Claims**



1. A system for converting the graphic symbols on a computer data entry keyboard to another set of graphic symbols such as another language of scientific symbols, the data entry keyboard having a plurality of data entry keys, said data entry keys having an upper exterior rectangular surface and downwardly extending sides, comprising in combination:

a plurality of keycaps, each keycap being adapted for positioning over the upper exterior surface of a data entry key on the computer data entry keyboard and adjacent to the downwardly extending sides of the data entry key, and having a top rectangular surface corresponding in size and shape to the upper exterior surface of the data entry key over which it is to be positioned, and further having a plurality of sidewalls extending downwardly and flared outwardly from the top rectangular surface for mateable receiving the adjacent sides of the data entry key to be covered, and a rim outwardly depending peripherally at a lower edge of the sidewalls, the rim having a plurality of lugs positioned midway on an inner edge thereof, for contacting the data entry key and further for separating an inner surface of the sidewall from the data entry key, each keycap having formed on the top rectangular surface thereof a first indicia corresponding to the graphic symbol to be displayed upon the striking of the data entry key, and still further having a second indicia on an interior surface thereof, the second indicia corresponding to the graphic symbol on the upper surface of the data entry key;

a cabinet having a size and shape adapted to receive the plurality of keycaps that are in a stacked relationship and an open top end for receiving the stacked keycaps; and

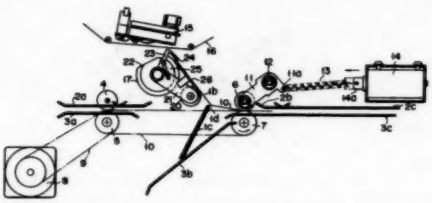
a lid for protecting the plurality of stacked keycaps when stored in the cabinet, the lid being sized to overlap a plurality of sidewalls of the cabinet and having an interior surface adapted to engage an upper edge of the cabinet.

5,183,347

APPARATUS FOR PRINTING IMAGES ON BOOKLETS

Kazuhiko Higuchi, Kawasaki; Shuzo Hirahara; Tutomu Saito, both of Yokohama; Hitoshi Nagato, Kawasaki, and Akito Iwamoto, Kamakura, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 627,592, Dec. 14, 1990, abandoned.
This application Jul. 28, 1992, Ser. No. 920,528
Claims priority, application Japan, Dec. 15, 1989, 1-323929
Int. Cl.[5] B41J *11/42*
U.S. Cl. 400—583.3 9 Claims



6. A process for printing images on booklets including a transparent page having one viewing face and another recording face comprising the steps of:

providing means for printing images on the recording face of the transparent page of the booklet;

transporting the recording face of the transparent page of the booklet to the printing means;

detecting on the booklet to be transported to the printing means whether the top or bottom of the booklet is transported first; and

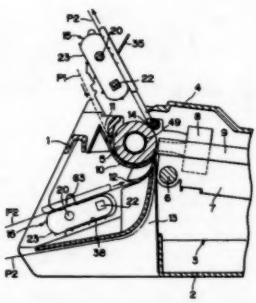
changing the layout of the images by means of one of an inverted image process and an image-by inversion process, based on whether the booklet on which the images are to be recorded is inserted into the apparatus with its top or bottom fed first and controlling printing of the images on the recording face of the transparent page of the booklet transported through the printing means.

5,183,348

PRINTER HAVING TRACTOR UNIT ATTACHABLE TO ONE OF UPSTREAM AND DOWNSTREAM SIDES OF PLATEN

Hiroyuki Kato, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 8, 1992, Ser. No. 895,107
Claims priority, application Japan, Jun. 14, 1991, 3-044904[U]
Int. Cl.[5] B41J *11/26*
U.S. Cl. 400—616.2 11 Claims



1. A printer for printing an image on a printing sheet comprising;

a chassis;

a platen rotatably supported by the chassis for supporting and feeding the printing sheet in a sheet feeding direction, the platen defining a printing section;

a tractor unit for feeding the printing sheet to the printing section, the chassis providing a first tractor unit attaching portion positioned downstream of the platen with respect to the sheet feeding direction and a second tractor unit attaching portion positioned upstream of the platen, the tractor unit being selectively mounted on one of the first and second tractor unit attaching portions; and

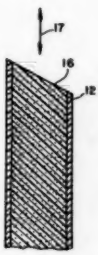
means for preventing another identical tractor unit of another printer from being attached onto one of the first and second tractor unit attaching portions if remaining one of the second and first tractor unit attaching portion has already accommodated therein the tractor unit.

5,183,349

LIPSTICK DISPENSER FORMED WITH LIPSTICK FORMULATION

Melvin E. Kamen, Highlands, N.J., assignor to Revlon Consumer Products Corporation, New York, N.Y.

Filed Nov. 15, 1990, Ser. No. 613,036
Int. Cl.[5] A45D *40/00, 40/18, 40/20*
U.S. Cl. 401—88 5 Claims



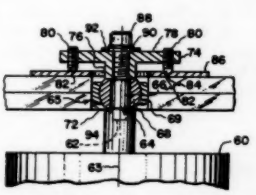
1. In combination, a lipstick bullet comprising a lipstick formulation suitable for application to the lips; and a dispenser sized and shaped so as to circumferentially encase said lipstick bullet; said dispenser comprising 5-50% lipstick formulation and 50-95% thermoplastic copolymer hardening agent wherein the color of said dispenser replicates the color of said lipstick bullet which is moveable relative to the dispenser such that the lipstick bullet can be ejected and retracted from the dispenser.

5,183,350

ADJUSTABLE FIXED MOUNT FOR A HOLOGON DEFLECTOR

Charles J. Kramer, Rochester, N.Y., assignor to Holotek Ltd., Rochester, N.Y.

Filed Dec. 12, 1991, Ser. No. 806,619
Int. Cl.[5] F16D *1/12*
U.S. Cl. 403—4 10 Claims



3. A mount for retaining a hologon disc unit having a central opening on a drive shaft having a rotational axis which comprises means connecting said unit to said shaft in fixed rota-

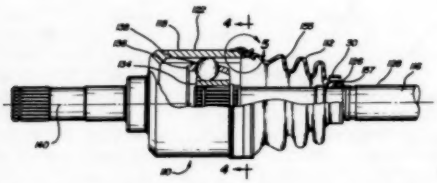
tional angular position therewith, which comprises a hub having a rotational axis coincident with the rotational axis of said shaft, said hub being disposed in said opening of said unit, means in said hub permitting angular movement of said unit about a plane perpendicular to said rotational axis, means included in said connecting means for retaining said unit on said shaft, said retaining means including alignment means spaced from said rotational axis and extending to said disc unit for changing said perpendicular angular orientation thereof, and said retaining means further comprising a cap attached in fixed nonrotating relationship to said shaft and extending radially from said rotational axis, said alignment means further comprising a plurality of members extending in the direction of said rotational axis into contact with said unit and angularly spaced from each other about said rotational axis and attached to said cap in independently movable relationship for tilting said unit to any angular position with respect to said plane perpendicular to said rotational axis to set said unit in fixed position substantially, exactly perpendicular to said rotational axis thereby substantially eliminating wobble of said unit about said perpendicular plane as said unit rotates.

5,183,351

BOOT RETAINER FOR A MECHANICAL JOINT

Dean J. Schneider, Highland, Mich., assignor to GKN Automotive, Inc., Auburn Hills, Mich.

Filed Jul. 23, 1991, Ser. No. 734,599
Int. Cl.[5] F16J *15/52*; F16L *51/02*
U.S. Cl. 403—50 **5 Claims**



1. A two piece boot retainer for a mechanical joint comprising:

an annular inner band rotatable with said mechanical joint, said annular inner band having a first end and a second end and defining a central axis, said annular inner band having its entire outer diameter smaller than the outer diameter of said mechanical joint;

first flange means located at said second end of said annular inner band and extending away from said central axis, said first flange means abutting a face of an outer member of said mechanical joint;

an annular outer band rotatable with said mechanical joint, said annular outer band having a first end and a second end, said second end fixably attached to and surrounding said mechanical joint, said first end of said annular outer band surrounding said second end of said annular inner band;

second flange means located at said first end of said annular outer band and extending towards said central axis;

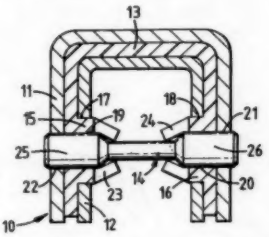
a portion of a boot sandwiched between said annular inner band and said annular outer band for sealing said mechanical joint and for retaining said boot on said mechanical joint by said first and second flange means.

5,183,352

PIVOT JOINT

Peter J. Carpenter, Labertouche, Australia, assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Feb. 19, 1992, Ser. No. 838,484
Claims priority, application Australia, Feb. 20, 1991, PK4687
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—79 **6 Claims**



1. A pivot joint for pivoting together first and second members, at least said first member being of channel section at said joint and said second member being adapted to seat within said first member, said pivot joint comprising:

a joint body of channel section adapted to seat within said first member and to receive said second member therewithin, said joint body having a pair of inwardly extending trunnions, each said trunnion having a bore therethrough, and being adapted to cooperate with corresponding apertures in said second member therewithin, each said bore being coaxial with apertures in said first member;

a pivot pin adapted to extend through said apertures of said first and second members and through each said bore in said trunnions of said joint body;

said pivot pin being retained in each said bore of said joint body by engagement with an inwardly directed resilient collar on each of said trunnions of said joint body; and

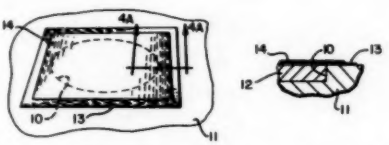
wherein said trunnions are annular and each said resilient collar is frusto-conical in shape such that an innermost edge of each said collar has an internal diameter less than a diameter of said bore in said trunnions to which it is attached.

5,183,353

PAVEMENT HOLE SEAL COVERED REPAIR FILL

Jack E. Buckelew, P.O. Box 64840, Dallas, Tex. 75206

Filed Oct. 21, 1991, Ser. No. 780,070
Int. Cl.[5] E01C *11/02*
U.S. Cl. 404—69 **12 Claims**



1. A water tight seal over covered paving repair material filled pavement hole comprising: a cleaned out pavement opening filled with a paving repair material fill tightly compacted therein; a coating layer of tar applied over the top of the paving repair material fill and extended outwardly beyond the peripheral edge of the hole and fill therein in every direction; and a sheet, laid down on said layer of tar, of material from the class of materials including, tar paper, an asphalt impregnated fiberglass coating material, a tar impregnated fiberglass coating material, linoleum and vinyl flooring material cut to slightly less area than and while smaller in area to substantially the same shape of the tar layer previously laid down.

5,183,354

PROCESS FOR IN SITU RECYCLING OF ELECTRICAL POWER DISTRIBUTION SWITCHYARD AGGREGATE SURFACING

Roger G. Wright, Pasco; Leon J. Lindbloom, Richland, and Lewis C. Midlam, Kennewick, all of Wash., assignors to SCM Consultants, Inc., Kennewick, Wash.

Filed Jul. 3, 1991, Ser. No. 725,437
Int. Cl.[5] E01C *19/00, 3/00*
U.S. Cl. 404—81 25 Claims

1. A process for recycling aggregate surfacing of an electrical power distribution switchyard, comprising the steps of:

removing a surface having a mixture of course aggregate and fine aggregate to expose an area;

separating the fine aggregate from the coarse aggregate;

replacing the fine aggregate on the exposed area to form a layer of fine aggregate; and

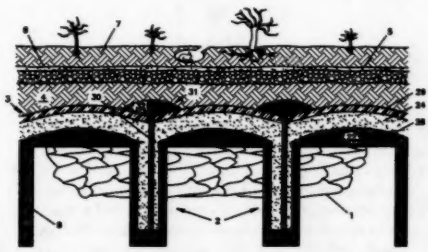
replacing the coarse aggregate on the layer of fine aggregate.

5,183,355

METHOD OF DRAINING WATER THROUGH A SOLID WASTE SITE WITHOUT LEACHING

Russell L. Treat; Glendon W. Gee, and Greg A. Whyatt, all of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Nov. 12, 1991, Ser. No. 791,746
Int. Cl.[5] B09B *5/00*
U.S. Cl. 405—128 19 Claims



1. A method of preventing leaching of solid waste sites having a top and a bottom, comprising:

(a) placing at least one drain hole extending from a first portion near the top of the solid waste site, through the solid waste site, to a second position substantially below the solid waste site,

(b) sealing the perimeter of each drain hole, and

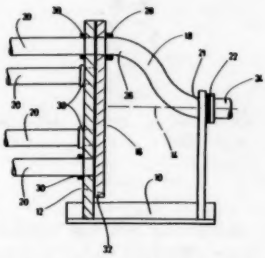
(c) directing percolating water toward each drain hole and beneath the solid waste site.

5,183,356

METHOD AND DEVICE FOR DISTRIBUTING PUMPABLE THICK MATTER INTO SEVERAL DELIVERY PIPES

Manfred Kempf, Aich, and Karl Schlecht, Stuttgart, both of Fed. Rep. of Germany, assignors to Putzmeister-Werk Maschinenfabrik GmbH, Aichtal, Fed. Rep. of Germany

Division of Ser. No. 640,410, Mar. 20, 1991, Pat. No. 5,127,429.
This application May 28, 1992, Ser. No. 889,857
Int. Cl.[5] E21D *11/10*
U.S. Cl. 405—146 5 Claims



1. A method of distributing sludge-type matter from a supply line into several distributor conduits, comprising the following steps:

directing the flow of matter from the supply line through a manifold conduit rotatably coupled about an axis of rotation on one end to the supply line and coupled on the other end to a rotating plate, the rotating plate being rotatable about the axis of rotation relative to a distributor plate, the distributor plate including one end of each of the distributor conduits coupled thereto and, thus, adapted to be coupled in fluid communication with the manifold conduit;

rotating the rotating plate relative to the distributor plate to align the manifold conduit with a respective distributor conduit and, in turn, directing the flow of matter therethrough; and

measuring the fluid pressure on the output side of the delivery conduit receiving the flow of matter therethrough and rotating the rotating plate to align the manifold conduit to another distributor conduit upon the fluid pressure exceeding a predetermined value.

5,183,357

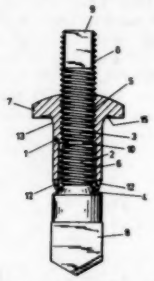
RIVET FASTENER WITH DRILLING BIT

Erich Palm, Heerbrugg, Switzerland, assignor to SFS Stadler Holding AG, Heerbrugg, Switzerland

PCT No. PCT/EP90/02291, § 371 Date Sep. 13, 1991, § 102(e) Date Sep. 13, 1991, PCT Pub. No. WO91/11628, PCT Pub. Date Aug. 8, 1991
PCT Filed Dec. 21, 1990, Ser. No. 761,880
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1990, 4003373
Int. Cl.[5] F16B *13/04, 13/06*
U.S. Cl. 411—29 20 Claims

1. A self-drilling rivet fastener, comprising a rivet casing and a rivet spindle inserted into said rivet casing, said rivet casing having an internal thread extending over at least a part of a length thereof and including a sleeve portion and a stop flange of a larger diameter, said rivet spindle including a bolt-shaped shaft having an external thread over at least a part of a length thereof and corresponding to said internal thread and adapted for threading thereinto and a head unit terminating with a drill bit for producing a hole in a workpiece for receiving the fastener, said internal and external threads being formed such that rotation of said rivet spindle to produce a hole in the workpiece will cause said rivet spindle to thread into said sleeve portion to set the rivet, said flange having shaped surface

means on a face thereof facing the workpiece to provide a fitting mount of said rivet casing against the workpiece, said



rivet casing being formed with predetermined breaking grooves extending parallel to an axis of the casing over a part of the length thereof starting at said stop flange.

5,183,358

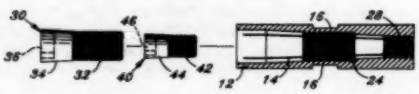
EXPANDABLE FIXTURE PIN FOR MACHINE TOOLS

Albert E. Foulkes, Jr., Bountiful Dr., Hackettstown, N.J. 07840, and John M. McHugh, 431 Beacon Hill Dr., Cheshire, Conn. 06410

Filed Jun. 29, 1992, Ser. No. 905,421

Int. Cl.[5] F16B *13/06*

U.S. Cl. 411—59 **7 Claims**



1. An expandable fixture pin for machine tools comprising:

a. a cylindrical body having an axial cavity defined from one end by progressively smaller sections including a first tapered section, a first cylindrical threaded section, a second tapered section and a second cylindrical threaded section, the body having peripherally spaced longitudinal slits outward from the tapered sections,

b. a first screw having a tapered head tapered comparably to the first tapered section and having threads engaging in the first threaded section and a hand-tool-engageable recess in the end of the head, and

c. a second screw having a tapered head tapered comparably to the second tapered section and having threads engaging in the first threaded section and a hand-tool-engageable recess in the end of the head,

whereby the body can be selectively expanded adjacent the tapered sections by rotating the respective screws by a hand tool inserted into said one end of the body.

5,183,359

ROTARY FASTENER WITH ANTI-STRIP-OUT NIBS

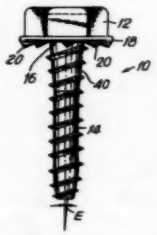
Gerald D. Barth, South Elgin, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed May 12, 1992, Ser. No. 881,523

Int. Cl.[5] F16B *39/282, 39/26*

U.S. Cl. 411—188 **9 Claims**

1. A torque-absorbing rotary threaded fastener member adapted to be tightened by rotation in one direction, and comprising a substantially radially extending clamping face, said clamping face having a periphery, a threaded shank extending axially therefrom, and a plurality of relatively small integral nibs on said clamping face spaced from one another by substantially planar uninterrupted portions of said clamping face and projecting axially therefrom for engaging a workpiece, each said nib being a polyhedron having an end wall on said periphery of said clamping face, a leading wall facing in the direction of tightening of said fastening member and being angularly disposed with respect to the plane of the clamping face by a leading wall angle, and a trailing wall facing opposite to the direction of tightening of said fastener member and being angularly disposed with respect to the plane of the clamping face by a trailing wall angle, said leading wall and said trailing



wall meeting each other and defining an apex having an outer end and an inner end, said outer end being where said apex meets said end wall, said apex being inclined by a taper angle with respect to the plane of said clamping face so that nibs increase in axial height from said inner end of said apex to said outer end of said apex, wherein said trailing wall angel is greater than said leading wall angle.

5,183,360

LIFTING EYEBOLT ASSEMBLY

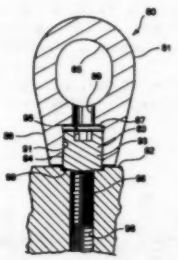
Lewis G. Freeman, 1509 Pontiac Dr., Kokomo, Ind. 46901

Continuation-in-part of Ser. No. 569,922, Aug. 20, 1990, Pat. No. 5,054,982. This application Aug. 13, 1991, Ser. No. 744,255

The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.

Int. Cl.[5] F16B *23/00, 45/00;* **B66C** *1/34*

U.S. Cl. 411—400 **17 Claims**



1. A lifting eyebolt assembly for connection between a workpiece to be lifted and a lifting device, the assembly comprising:

a fastener having a head portion, a shaft portion and means for fastening said shaft portion to the workpiece;

a load-bearing ring having an eye portion and a base portion, said eye portion having an opening for connection to the lifting devices, said base portion defining a cavity for receiving and containing said head portion of said fastener therein;

means, within said cavity, for engaging said head portion of said fastener to said base portion of said load-bearing ring with said shaft portion of said fastener extending outwardly therefrom; and

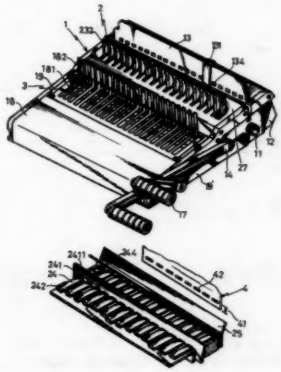
means for accessing said head portion of said fastener when said fastener is contained within said cavity of said base portion.

5,183,361

PUNCHING AND BINDING MACHINE

Jackson Ho, 1st Fl., 17, Lane 10, Chung Shan Rd., Panchiao City, Taiwan

Filed Nov. 4, 1991, Ser. No. 786,939
Int. Cl.[5] B42B *5/10*
U.S. Cl. 412—16 **5 Claims**



1. A punching and binding machine to punch papers by transverse feeding of punchers and then bind such papers with a binding ring, comprising

a body composed of a left body element and a right body element, having a knob, a pull lever and a control lever at their appropriate positions on a side of the right body element, a stop plate extended upwards from the back of the body, a movable adjusting board mounting on the stop plate, a seat portion formed on the back of the adjusting board and movably fixed on the stop plate by means of a fixing bolt, and a plurality of punching marks located beneath the stop plate for aligning of papers;

a punching mechanism located in the rear part of the body, incorporated with a linking gear on the body and engaging with a lower gear below a control cam in connection with an upper gear for engaging with a rack beneath a feeder block with a plurality of vertical puncher control levers to push a plurality of punchers arranged in parallel, each positioned in a slot below a fixing plate, having a bent portion at a side of its rear end and an arched cutter at its front end, and having a paper holder in front of the punchers incorporated with a support element having an eccentric rod in it so that by rotation of the knob, the distance between the position to be punched and the edge of papers can be controlled, and a upper cover to cover the punching mechanism;

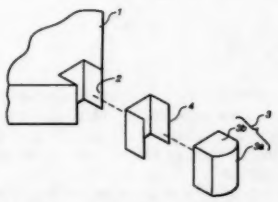
a binding mechanism having a sliding slot and two fixing holes on the left body element, and a sliding slot and two fixing holes on the right body element for installation of a sliding board, a support rod and a transmission shaft, in which the sliding board has a positioning element at one end and another positioning element at another end, each of the positioning elements has an oblique slot at the front end for holding of a tab extended from an end of the shifter holder, and to position the positioning elements in the sliding slots on the left and right body elements, a rack is located at the lower end of each positioning element to engage with a sector gear at each end of the transmission shaft which is extended to outside of the right body element to connect a control lever, the shifter holder has a plurality of L-like shifters, a passing slot and positioning slot are designed below the sliding slot of the left body element for fixing of a stopper element by means of a round head bolt in order to permit the stopper element to slide forwards or backwards in the passing slot and the sliding slot, and an upper casing is used to cover the binding mechanism with a plurality of long slots at appropriate positions for passing of the shifters, and a fixing plate extended vertically upwards from the back of each long slot for holding of a binding ring.

5,183,362

CUTTING TOOL ASSEMBLY

Yutaka Kuroyama; Masami Maeno, and Ikuo Sakakibara, all of Aichi, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 639,244, Jan. 8, 1991, abandoned. This application Mar. 30, 1992, Ser. No. 861,336
Claims priority, application Japan, Jan. 10, 1990, 2-1369[U]; Feb. 21, 1990, 2-17216[U]; Apr. 13, 1990, 2-40184[U]
Int. Cl.[5] B23P *15/28*
U.S. Cl. 407—118 **7 Claims**



1. A cutting tool for cutting a workpiece, the cutting tool comprising:

a base having a thickness and a corner, a recess being formed at the corner in the base so as to extend the entire thickness of the base, the recess having a first inner surface and a second inner surface which are substantially perpendicular to each other; and

a cutter assembly including a cutting tip and a support extending the entire thickness of the base such that the cutting tip has a pair of cutting edges on opposite sides thereof; and wherein

the tip is substantially triangular in shape, having a first contact surface and a second contact surface which are substantially perpendicular to each other,

the support is substantially rectangular in shape with first and second mutually opposite side surfaces and first and second mutually opposite end surfaces which are substantially perpendicular to and smaller in area than the first and second side surfaces,

each of the side surfaces of the support is smaller in area than the second inner surface of the recess,

the first contact surface of the tip is attached to the first end surface of the support,

the second end surface of the support is attached to the first inner surface of the recess, and

the second contact surface of the tip and the second side surface of the support are attached to the second inner surface of the recess such that a distal portion of the first inner surface of the base is exposed.

5,183,363

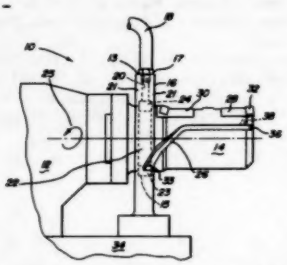
NON-CONTACT COOLANT SUPPLY APPARATUS

Lee Reiterman, Royal Oak; Dale D. Martin, Sterling Heights, and Joseph Krysik, Ortonville, all of Mich., assignors to GTE Valenite Corporation, Troy, Mich.

Filed Jul. 17, 1992, Ser. No. 916,297
Int. Cl.[5] B23B *47/34*
U.S. Cl. 408—59 **7 Claims**

1. A non-contact coolant supply apparatus for a cutting tool for cutting a workpiece wherein there is relative cutting motion about an axis of rotation between a cutting member mounted upon a tool shank, said shank having at least one helical coolant passage opening in the outside diameter of the

tool shank, and an annular groove formed therein and a workpiece; wherein coolant is supplied from a coolant supply means through a ring bore defined by ring bore walls which extend from an outer peripheral surface to an inner peripheral surface of a coolant supply ring which is fixedly mounted; said tool shank passing through said coolant supply ring with a close clearance therebetween such that the inner peripheral surface



is positioned directly over, and circumferentially surrounds said annular groove in the tool shank so that coolant is introduced through the ring bore to the annular groove on the tool shank, and the rotation of the tool shank causes the helical coolant passage to act as an impeller to force the coolant through the helical coolant passages and into close proximity to the cutting members.

5,183,364

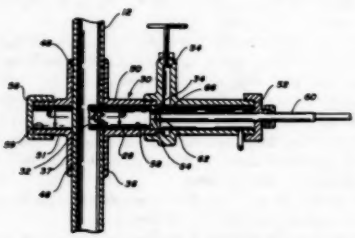
DEVICE FOR INSTALLING AN IN-LINE VALVE

Ronald B. Hardwig, Rte. 2, Box 109, Makanda, Ill. 62958

Filed Nov. 26, 1991, Ser. No. 798,628

Int. Cl.[5] B23B *41/08*

U.S. Cl. 408—67 **10 Claims**



1. A device for installing an in-line valve in a pipe having sidewalls, said device comprising a hollow coring bit with a cutting end and a driven end and a boring and support housing sealed to the pipe, said housing having first and second closed chambers communicating with the pipe where it is sealed to the housing, said first chamber having a passage for containing and supporting the hollow coring bit and directing the cutting end of the hollow coring bit against and through the sidewalls of the pipe cutting away sections thereof, said second chamber having a passage in alignment with the passage in the first chamber for receiving the cutting end of the hollow coring bit, said housing having means for reciprocating the hollow coring bit in the passages of the first and second chambers, said hollow coring bit having a pressure relief hole in the driven end, said pressure relief hole connecting the interior of the hollow coring bit with the interior of the first chamber to substantially equalize axial pressure on the driven end, said hollow coring bit forming means for plugging flow in the pipe when the cutting end of the hollow coring bit is in the second chamber whereby said hollow coring bit forms an in-line valve when the hollow coring bit is axially reciprocated between an open and a closed position.

5,183,365

BORING AND SURFACING MACHINE

George Silk, Nottinghamshire, England, assignor to Silk Engineering (Derby) Limited, Derby, England

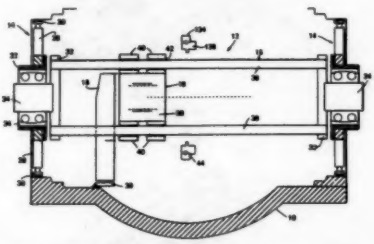
PCT No. PCT/GB89/01412, § 371 Date May 24, 1991, § 102(e) Date May 24, 1991, PCT Pub. No. WO90/06201, PCT Pub. Date Jun. 14, 1990

PCT Filed Nov. 24, 1989, Ser. No. 689,794

Claims priority, application United Kingdom, Nov. 25, 1988, 8827538

Int. Cl.[5] B23B *41/00*

U.S. Cl. 408—80 **22 Claims**



1. A machine tool comprising a rotatable carriage rotatably located on mounting means, the mounting means enabling the machine tool to be positioned and secured relative to a work piece, the rotatable carriage supporting a tool carriage mounted for axial movement on the rotatable carriage relative to the axis of rotation of the rotatable carriage and a tool post mounted on the tool carriage for radial movement relative to the tool carriage, drive means for rotatably driving the rotatable carriage and for driving the tool carriage axially relative to the rotatable carriage, and for driving the tool post radially relative to the tool carriage, wherein the drive means for driving the tool post comprises a power source located remotely from the tool post and a tool post drive transmission coupling the power source to the tool post and including a drive lead screw coupled to the power source and engaging a worm gear having an internal thread engaging a tool post lead screw attached to the tool post.

5,183,366

ROD HANDLER APPARATUS

Ivor N. Paech, Christies Beach, Australia, assignor to Longyear Company, Salt Lake City, Utah

Filed Dec. 4, 1990, Ser. No. 621,755

Int. Cl.[5] E21B *19/14*

U.S. Cl. 414—22.52 **15 Claims**

8. A rod handler apparatus for selectively transferring a drill rod from a first position in a stack in a rod rack to a second position substantially aligned with a bore hole which has a central axis comprising:

a base having a longitudinal axis, the base including a rear end portion adjacent to the bore hole and a front end portion that is longitudinally spaced from the rear end portion and is adjacent to the rod rack;

an elongated boom assembly having a central axis of elongation, the boom assembly including a first end portion and a second end portion;

means for mounting the boom assembly to the base, said boom assembly mounting means mounting the boom assembly for movement relative to the base between a boom assembly rod release first position and a boom assembly rod pick up position;

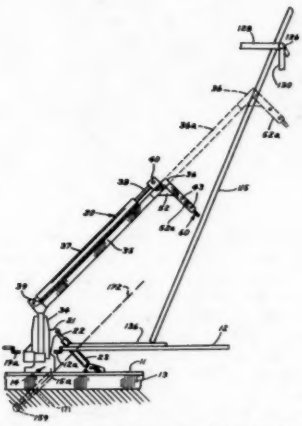
a rod gripping assembly including first jaw means movable between a jaw mens rod gripping position and rod release position and the first power operated means for moving the first jaw means between the rod gripping and rod release positions;

an elongated arm member including a first end portion and a

second end portion, the arm member second end portion being closer to the rod rack than the arm member first end portion when the gripping assembly is positioned adjacent to a rod in the rod rack;

first means for mounting the arm member first end portion to the boom assembly second end portion;

gripping assembly mounting means mounted to the arm member second end portion, the gripping assembly mounting means mounting the gripping assembly for limited free pivotal movement relative to the arm member about a gripping assembly axis which extends in a transverse direction relative to the base; and



second power operated means for operatively moving the boom assembly and thereby moving the arm member to move the gripping assembly upwardly and longitudinally rearwardly relative to the base after the gripping assembly has been positioned adjacent to a rod in the rod rack and thence moving the gripping assembly into alignment with the bore hole central axis, said second power operated means being connected to at least one of the boom assembly and the boom assembly mounting means

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5,183,367

DAGGER BOARD STORAGE HOUSING FOR SAILBOARDS

Marc Namur, IM Harras, 10, D-6100 Darmstadt, Fed. Rep. of Germany

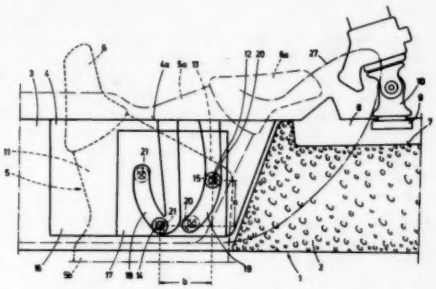
Filed Sep. 3, 1991, Ser. No. 753,662

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4028033; Sep. 17, 1990, 4029422

Int. Cl.[5] B63B *35/79*

U.S. Cl. 441—79 **2 Claims**

1. Dagger board bearing for sailboards, with a dagger board casing (4) inserted in a sailboard (1), wherein a dagger board (5) introductible from above and having a first handle (6) projecting past a topside (4a) of the sailboard (1) is pivotally supported, characterized by an external pivot pin (12) in the zone of a top edge (13) of the dagger board (5), arranged at a top section (11) of the dagger board (5), and by an internal pivot pin (14) offset with respect to the external pivot pin (12), these pivot pins (12, 14) being molded onto one side of the top section (11) of the dagger board (5) with a mutual first spacing (a) in the longitudinal direction of the dagger board (5) and with a mutual second spacing (b) in the transverse direction of the dagger board (5), as well as by two guide and bearing grooves (18, 19) to accommodate the pivot pins (12, 14) arranged in a sidewall (16) of the dagger board casing (4) and designed to be of a curved shape, these bearing grooves (18, 19) extending in the vertical direction of the dagger board casing (4) up to the topside (4a) of the sailboard (1) in such a manner that, during the outward and inward pivoting of the dagger board (5), the two pivot pins (12, 14) form two variable fulcrums (20, 21), and the dagger board (5) pivots about a variable, imaginary fulcrum (22) resulting from the point of



intersection of two normals (23, 24) with two tangents (25, 26) in the guide and bearing grooves (18, 19) at the variable fulcrums (20, 21) for respective positions of the dagger board (5) during the outward and inward pivoting thereof.

5,183,368

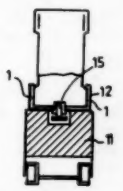
APPARATUS FOR TRANSPORTING LIGHT LOADS BY MEANS OF SELF-PROPELLED CARRIAGES ON RAILS

Pierre René Douard, Voisins le Bretonneux, France, assignor to Fluidelec, France

Filed May 23, 1991, Ser. No. 704,487

Int. Cl.[5] B65H *5/00*

U.S. Cl. 414—222 **13 Claims**



1. Apparatus for transporting light loads in the range of 10 to 15 kg comprising:

at least one self-propelled carriage having a longitudinal axis and movable on rails along said axis, said rails having horizontal and vertical portions, said carriage being provided with a first assembly profile oriented parallel to said axis and with first locking means;

at least one removable container having a hollow body and a cover which is hinged on a lateral face of said body about a pivoting axis, said container having a second assembly profile formed both on said body and on said cover and oriented at right angles with said pivoting axis, and shaped so as to be slidingly assembled with said first assembly profile once placed in an assembly position by effecting a relative translational displacement of said carriage with respect to said container along said longitudinal axis on a loading portion of said rail, said removable container further having first and second bearing surfaces respectively formed on said body and on said cover and oriented at right angles with said pivoting axis, and second locking means which cooperate with said first locking means so as to provide a rigid attachment between said carriage and said container once assembled;

at least one loading station comprising means for placing and

retaining said container in front of said loading portion in said assembly position;

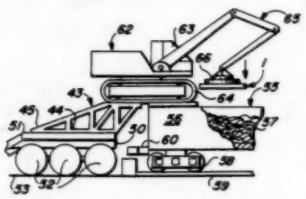
at least one unloading station comprising an unloading portion of rail, holding means for retaining said container while being transported by said carriage on said unloading portion, two parallel conveyors disposed in front of said unloading portion and under said bearing surfaces when said carriage provided with said container is in said unloading portion so as to allow disassembling of said container from said carriage according to an unloading sequence comprising an unlocking step of said locking means, a translational displacement of said carriage while said container is retained by said holding means and a conveying step of said container of said conveyor once said container is disengaged from said carriage.

5,183,369

ACCESS AND SUPPORT APPARATUS FOR LOADING AND UNLOADING GONDOLA CARS

Bobby G. Warren, Jr., Rte. 1, Box 337, Sibley, La. 71073, and James D. Davis, Rte. 2, Box 535, Minden, La. 71055

Filed Apr. 1, 1991, Ser. No. 678,229
Int. Cl.[5] B65G *67/02*
U.S. Cl. 414—339 **6 Claims**



1. In an open top gondola railroad car and a crane-type crawler having parallel tracks and an electromagnet for unloading the open top gondola railroad car, the improvement comprising an adjustable pallet for positioning on the top edges of upwardly-extending sides defining the open top of the gondola railroad car and supporting the crane-type crawler, said adjustable pallet comprising a frame characterized by a pair of spaced spanning members; at least two-cross members connecting said spanning members in spaced relationship; a flat top plate spanning said frame substantially equidistant form the ends of said spanning members for supporting the crane-type crawler; a pair of guides upward-standing from said top plate in spaced relationship for guiding the tracks of the crane-type crawler over said adjustable pallet and a web radius provided in said guides for accommodating said electromagnet; and adjusting means carried by said frame for adjustably contacting the sides of the gondola railroad car and compensation for irregularities due to bulging of the sides of the gondola railroad car.

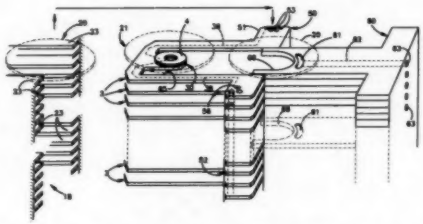
5,183,370

APPARATUS FOR PLACING OR STORING FLAT ARTICLES IN A CASSETTE WITH INTERMEDIATE RACKS

Didier Cruz, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 17, 1990, Ser. No. 628,487
Claims priority, application France, Dec. 29, 1989, 89 17450
Int. Cl.[5] B65G *65/23*
U.S. Cl. 414—416 **10 Claims**

1. An apparatus for placing or storing flat articles (**20**) in a storage cassette (**18**) and which are stored parallel to one another, placed on lateral supports (**23**) with a predetermined number (N) of racks and separated from one another by a predetermined clearance (E) comprising a gripping means (**50,70**) having the same number (N) of horizontal tracks (**2**) separated from one another by the same predetermined clearance (E) and each terminated by a gripping end (**6**), wherein are positioned means for the gripping and releasing of a flat article (**20**) with respect to a corresponding rack of the storage cassette (**18**); an intermediate cassette (**60,80**) for temporarily holding one or several articles (**20**) which must be stored again in the storage cassettes having a second number (M) of horizontal racks, equal to or greater than the first number (N) of racks of the storage cassette (**18**) and which are spaced from one another by said clearance (E) in order to receive the flat



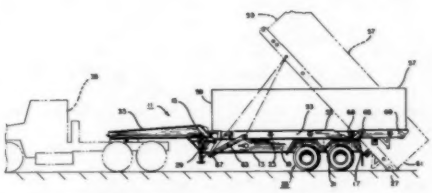
articles (**20,21,22,25**); and a relative horizontal translation between the gripping means (**50,70**) and the intermediate cassette (**60,80**) in order to obtain an interpenetration of the gripping means (**50**) in the intermediate cassette (**60**) taking place by means of recesses (**65**) to the rear of each of the tracks (**2**) of the gripping means (**50**), in order to enable the intermediate cassette (**60**) to penetrate the gripping means (**50**) from the rear and up to a mobile part (**4**) of the track, permitting the transfer in both directions of at least one flat article (**20**) between the gripping means (**50,70**) and the intermediate cassette (**60,80**).

5,183,371

EXTENDABLE ROLLOFF TRAILER

Harold W. O'Daniel, 1018 N. Commercial Blvd., Arlington, Tex. 76017

Filed Apr. 5, 1991, Ser. No. 680,986
Int. Cl.[5] B60P *1/32*
U.S. Cl. 414—477 **6 Claims**



1. An extendable rolloff trailer, comprising:

a main trailer frame having a front end, a rear end and opposing sides which together define a top support surface, the main trailer frame also including a rear wheel assembly for rotatably supporting the main trailer frame for movement over a surrounding terrain;

an extendable inside frame having opposite sides, a rear portion which is telescopingly received within the opposing sides of the main trailer frame and having a front, tongue portion for coupling with a pulling source;

a tilt frame pivotally mounted on the top support surface of the main trailer frame, the tilt frame having an upper, container support surface of a defined length for supporting a load bearing container of the type having a front end, a rear end, a width and a length which generally approximates the length of the container support surface of the tilt frame and

wherein the tilt frame is provided with a plurality of rollers located generally coplanar with the upper, container

support surface for supporting the load bearing container and for facilitating a discharge of the container from the trailer when the tilt frame is tilted from a horizontal position to an angular position with respect to the main trailer frame;

pivot means operably connected between the main trailer frame and the tilt frame for pivoting the tilt frame and its associated container about a pivot point located on the main trailer frame;

indexing means for securing the extendable frame in a plurality of longitudinally spaced positions with respect to the main trailer frame; and

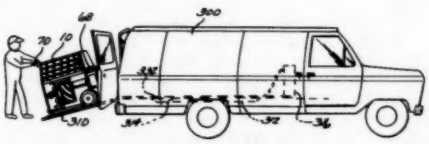
locking means for locking the front end of the container to the tongue portion of the extendable frame, whereby telescopic extension of the extendable frame with respect to the main trailer frame moves the trailer to an extended position which defines a center location between opposing ends of the extended trailer and wherein such telescopic extension redistributes the container load toward the center location of the extended trailer.

5,183,372

VAN-MOUNTED SERVICE CARTS FOR SKILLED TRADESMEN

Daniel Dinverno, 7511 Intervale, Detroit, Mich. 48238-2401

Filed Feb. 12, 1991, Ser. No. 654,213
Int. Cl.[5] B60P *1/00*
U.S. Cl. 414—538 **9 Claims**



1. In a motor vehicle having an enclose cargo storage area with a floor, the improvement comprising:

a removable service cart for transporting tools, the service cart including tool storage means for storing tools and equipment within the service cart and wheel means connected to the service cart for moving the service cart across generally planar surfaces, the wheel means having at least one fixed axis of rotation common with respect to two wheels, the tool storage means including a rectangular box-like lower portion of the service cart having an elongated longitudinal axis normal to the one common fixed axis of rotation, the elongated longitudinal axis defining a length of the lower portion greater than a width and a height of the lower portion, and an upper portion of the service cart having at least two sidewalls inclined and upwardly extending toward one another along at least a part of a length of the upper portion of the service cart, such that a top extending between the sidewalls has a width less than the width of the lower portion, the upper portion having a height substantially the same as the height of the lower portion;

retractable ramp means normally stored on the floor of the motor vehicle and extendible beyond the floor for bridging space between the floor and the adjacent ground to allow removal of the service cart by wheeling the service cart across the floor and across the ramp means to the ground; and

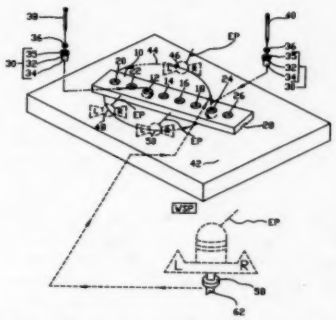
winch means connected to the motor vehicle within the enclosed storage area and connectible to the service cart for winching the service cart across the ramp means between the ground and the floor of the storage area.

5,183,373

CIRCLE MARKING AND CUTTING GUIDE TEMPLATE

Burton R. Floyd, Jr., Williamsburg, Ky., assignor to The Floyd and Gilbert Company, Williamsburg, Ky.

Filed Oct. 18, 1991, Ser. No. 778,525
Int. Cl.[5] B23C *1/20;* **B27C** *5/10;* **B43L** *9/04*
U.S. Cl. 409—179 **12 Claims**



1. A template device for guiding a marking implement in marking circular lines upon a workpiece and, interchangeably, for guiding a cutting bit as in a hand held electric powered router in following the circular lines in a cutting engagement with the workpiece surface comprising;

a) a guide plate comprising a planar member having paralleled opposed major faces;

b) a plurality of guide holes of equal diameter extending thru said major faces;

c) said guide holes comprising a plurality of at least three evenly spaced holes in alignment;

d) said guide holes further comprising a plurality of unevenly spaced holes;

e) the spacing of said unevenly spaced holes being different from the spacing between said evenly spaced holes;

f) said unevenly spaced holes located at the end of said alignment of evenly spaced holes;

g) a first bearing containing pivoting means for said guide plate;

h) said first bearing comprising a bearing shaft, having a center hole, said shaft insertable, rotatable and removable within each of said guide holes;

i) a second bearing containing means for marking;

j) said second bearing comprising a bearing shaft, having a center hole, said shaft insertable, rotatable and removable within each of said guide holes;

k) said second bearing interchanging within one of said guide holes with a like diametered means encircling and centering a cutting bit.

5,183,374

HORIZONTAL BROACH WITH A MOBILE STANDARD

Henri Line, Peymeinade, France, assignor to Helis, Peymeinade, France

Filed Sep. 27, 1990, Ser. No. 589,444
Claims priority, application France, Sep. 27, 1989, 89 12663
Int. Cl.[5] B23D *41/00*
U.S. Cl. 409—286 **7 Claims**

1. A machine-tool, comprising:

a lower base having a substantially horizontal lower means for guiding;

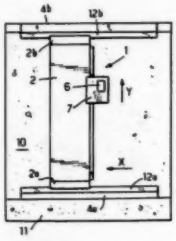
an upper base having an upper means for guiding substantially parallel to said lower means for guiding;

a rigid static support for interconnecting said lower base to said upper base;

a vertical mobile standard having a lower end cooperating with said lower means for guiding and an upper end coop-

erating with said upper means for guiding, said mobile standard being positioned between said lower base and said upper base;

a broach support mounted on said mobile standard;



a horizontal broach borne by said broach support; and

synchronized drive means cooperating with said mobile standard for driving said mobile standard at each of its ends with respect to said lower and upper bases.

5,183,375

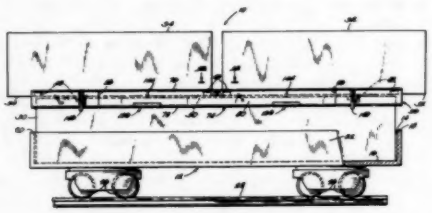
CONTAINER STACKING APPARATUS

Gary L. Fenton, Stoughton; Gerald A. Sill, Edgerton, both of Wis.; Robert S. Ingram, Forth Worth, Tex., and James G. Jimenez, San Francisco, Calif., assignors to Stoughton Trailers, Inc., Stoughton, Wis.

Filed Jan. 18, 1991, Ser. No. 643,998

Int. Cl.[5] B65D *90/12;* **B65G** *1/14*

U.S. Cl. 410—35 **17 Claims**



6. A container stacking apparatus for use in supporting an upper tier including two cargo containers in stacked relation on a lower tier including a first cargo container, the first cargo container having a length which is greater than the length of each of the two cargo containers, the containers stacking apparatus comprising:

a frame including means for supporting the frame on the lower tier, the frame being adapted to be supported solely by the first cargo container, and means for supporting the upper tier on the frame and in stacked cantilevered relation to the lower tier, the means for supporting the upper tier being adapted to support the pair of cargo containers lengthwise in end-to-end relation, and the frame being adapted to solely support the second tier,

means for releaseably locking the frame down against the lower tier, and

means for releaseably locking the upper tier down on the frame.

5,183,376

ARRANGEMENT FOR LOADING AND UNLOADING OF HEAVY PACKAGES

Per T. Aralt, Hopsnesvn. 75, N-5043 Hop, Norway

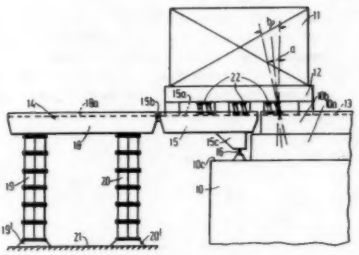
PCT No. PCT/NO89/00060, § 371 Date Dec. 5, 1990, § 102(e) Date Dec. 5, 1990, PCT Pub. No. WO89/12598, PCT Pub. Date Dec. 28, 1989

PCT Filed Jun. 15, 1989, Ser. No. 623,451

Claims priority, application Norway, Jun. 16, 1988, 882664

Int. Cl.[5] B66F *9/00*

U.S. Cl. 414—592 **6 Claims**



1. An arrangement for lifting and lowering a heavy load comprising

a support member for receiving a heavy load thereon, said member having a main frame and a plurality of support means depending from said frame to support said frame on a foundation;

a support element for receiving said support means therein;

a plurality of lifting means between said support member and said support element, each lifting means being secured to said support member and being movable between a retracted position and an extended position to move said member and said element vertically relative to each other;

a plurality of pairs of hollow support columns for selectively receiving a flowable medium therein; and

a plurality of pairs of support legs, one of said support legs of each pair being secured to said support member and slidably received in a respective one of said support columns and the other of said support legs of each pair being secured to said support element and slidably received in a respective another of said support columns.

5,183,377

GUIDING A ROBOT IN AN ARRAY

Eberhard Becker, Hagen; Franz Schulte, Sudern; Hartwig Sprung; Ronald Staggl, both of Wetter, and Manfred Stoeber, Witten, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Düsseldorf, Fed. Rep. of Germany

Filed May 30, 1989, Ser. No. 359,083

Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818757

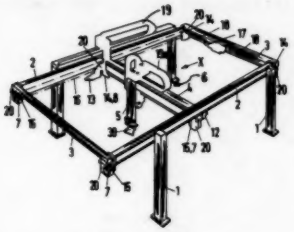
Int. Cl.[5] B25J *17/00*

U.S. Cl. 414—751 **9 Claims**

1. A two dimensional mounting structure for an industrial robot, the robot being comprised of a carriage with a lifting post and a manipulator connected to the post, the mounting structure including longitudinal rail carriers, transverse connectors and a movable rail, there being carriage elements by means of which the movable rail runs on rails of the longitudinal rail carriers, the carriage for the robot running on the movable rail, the improvement comprising:

a plurality of essentially similarly constructed end elements, first ones of the end elements connecting the ends of the longitudinal rail carriers to the ends of the transverse connectors, others of the end elements connecting respective opposite ends of the movable rail to the carriage elements by means of which the movable rail runs on the longitudinal rail carriers; and

wherein said end elements as connected to the ends of the movable rail are mounted underneath said carriage elements by means of which the movable rail runs on the longitudinal rail carriers.



5,183,378

WAFER COUNTER HAVING DEVICE FOR ALIGNING WAFERS

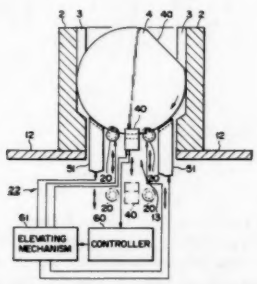
Takanobu Asano, Yokohama, and Katsumi Ishii, Kanagawa, both of Japan, assignors to Tokyo Electron Sagami Limited, Kanagawa, Japan

Filed Mar. 20, 1991, Ser. No. 672,852

Claims priority, application Japan, Mar. 20, 1990, 2-71560; May 28, 1990, 2-138020

Int. Cl.[5] B65G *47/24*

U.S. Cl. 414—757 **9 Claims**



1. A wafer counter device for counting wafers having orientation flats denoting an orientation of said wafer, comprising:

wafer aligning means for aligning orientation flats of a plurality of aligned wafers with one another; and

counting means having a non-contact type sensor for detecting the aligned wafers, said counting means counting the number of wafers based on a result of a non-contact detection of the aligned wafers performed by said non-contact type sensor;

wherein said wafer aligning means comprises a pair of aligning rollers disposed in parallel to abut against a periphery of a wafer to rotate said wafer, and rotating means for rotating said aligning rollers, wherein an annular groove is formed in a portion of each of said aligning rollers which abuts against the periphery of the wafer.

5,183,379

Patent Not Issued For This Number

5,183,380

APPARATUS INCLUDING AN ENDLESS POCKET CONVEYOR FOR AUTOMATICALLY TRANSFERRING STACKS OF PACKAGING BLANKS TO A BLANK MAGAZINE OF A PACKAGING MACHINE

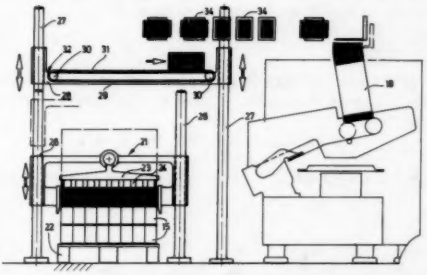
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Dec. 28, 1990, Ser. No. 635,097

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1990, 4001051

Int. Cl.[5] B65G *65/02*

U.S. Cl. 414—795.8 **18 Claims**



7. An apparatus for conveying stacks of blanks to a packaging machine, said apparatus comprising:

a) a blank magazine **(19)** associated with the packaging machine;

b) an endless pocket conveyor, movable in a horizontal plane, for intermittently feeding the blanks to the blank magazine **(19)**,

c) said endless pocket conveyor **(18)** having a plurality of individual pockets **(34)** for holding individual stacks **(15)** of the blanks, said pockets being movable only in said horizontal plane;

d) conveyor means **(17, 36)** for conveying individual blank stacks **(15)** to the individual pockets **(34)**,

e) wherein each of said pockets **(34)** has a generally rectangular configuration, each pocket being closed at a top, a bottom and two sides thereof and having two oppositely arranged open ends; and

f) first pushing means **(35, 48)**, located near said blank magazine **(19)**, for horizontally entering one of said open ends of said pocket and horizontally pushing the blank stacks **(15)** out of the other of said open ends and into the blank magazine **(19)**.

5,183,381

VARIABLE GEOMETRY TURBINE INLET WALL MOUNTING ASSEMBLY

Peter S. McKean, Huddersfield, England, assignor to Holset Engineering Company Limited, Huddersfield, England

Continuation-in-part of Ser. No. 352,094, May 15, 1989, Pat. No. 4,984,965. This application Jan. 15, 1991, Ser. No. 641,208

Claims priority, application United Kingdom, May 17, 1988, 8811621

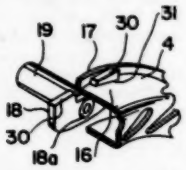
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

Int. Cl.[5] F01D *17/12*

U.S. Cl. 415—150 **5 Claims**

1. A mounting assembly for a movable annular wall member of an inlet passageway of a variable geometry turbine, wherein the inlet passageway is defined between the movable wall member and a facing wall, the movable wall member being formed from a sheet material, and the movable wall member being supported on a plurality of guide elements which are

movable parallel to its direction of movement, the improvement comprising means for interconnecting said movable wall member and said guide elements with a relatively close fit in



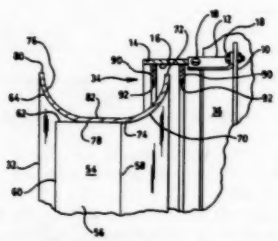
the direction of movement of said movable wall member and a relatively loose fit in a plane at right angles to the direction of movement of said movable wall member.

5,183,382

LOW NOISE ROTATING FAN AND SHROUD ASSEMBLY

Jim K. Carroll, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 3, 1991, Ser. No. 754,101
Int. Cl.[5] F04D *29/08*
U.S. Cl. 415—173.6 **17 Claims**



1. A cooling system adapted for use with an engine and an enclosure surrounding a rotating fan and shroud assembly; said cooling system comprising:

a rotating fan and shroud assembly having a center core being in driven relationship to the engine;

a plurality of radially extending blades being attached to the core, each of said plurality of blades including a body having a preestablished width, a leading edge, a trailing edge and a tip;

a shroud being positioned around the plurality of blades and being attached to the core, said shroud having a generally "C" shaped circular configuration, and inlet bell-mouth portion having a first end and a second end, an outlet bell-mouth portion having a first end and a second end, and an intermediate portion fixedly interposed between the second end of the inlet bell-mouth portion and the first end of the outlet bell-mouth portion, the juncture of the second end of the inlet bell-mouth portion and the intermediate portion is generally radially aligned with the leading edges of the plurality of blades, the juncture of the first end of the outlet bell-mouth portion and the intermediate portion is substantially centered on the width of each of the plurality of blades, the first end of the inlet bell-mouth portion extending radially outward from the tips of the plurality of blades and extending axially beyond the leading edges of the plurality of blades, and said second end of the outlet bell-mouth portion extending radially outward from the tips of the plurality of blades and extending axially beyond the trailing edges of the plurality of blades; and

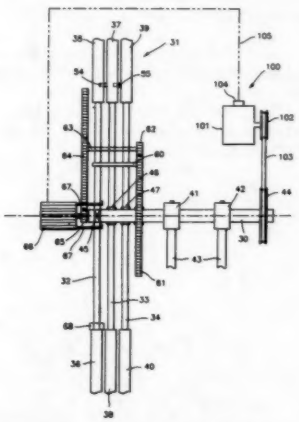
a labyrinth-type seal including a pair of flexible members being attached to the enclosure, said pare of flexible members bring positioned axially on opposite sides of one of the first end of the inlet bell-mouth portion and the second end of the outlet bell-mouth portion a preestablished distance and each of the pair of flexible members having an inner peripheral surface radially inward of one of the first end of the inlet bell-mouth portion and the second end of the outlet bell-mouth portion of preestablished distance.

5,183,383

WIND TURBINE

Hendrik A. Baas, Groningerweg 34, 9738 AB Groningen, Netherlands

Filed Jan. 8, 1991, Ser. No. 638,737
Claims priority, application Netherlands, Jan. 8, 1990, 9000042
Int. Cl.[5] F03B *7/00*
U.S. Cl. 416—9 **24 Claims**



1. A wind turbine having a rotor including a plurality of vanes mounted on a shaft and comprising:

a rotatably mounted central shaft having an axis of rotation;

a plurality of vanes arranged in sets mounted in axially space relationship on said central shaft;

at least one of said sets of vanes being freely rotatably mounted on said central shaft for rotation relative thereto;

at least one of said sets of vanes being non-rotatably mounted on said central shaft for rotation therewith;

a catch means operatively coupling adjacent sets of vanes together so that rotation of one of said sets rotates at least one adjacent set;

detecting means for detecting impending overload of said rotor and emitting a signal indicating said overload; and

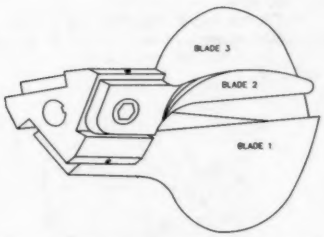
vane set adjusting means operatively engageable with said at least one set of freely rotatable vanes and operatively connected with said detecting means for rotating said at least one rotatably mounted set of vanes relative to said shaft and said at least one non-rotatably mounted set of vanes to positions between and including a fully extended position of, where said vanes have a maximum angular displacement relative to each other in the direction transverse to the axis of rotation of said shaft, and an axially aligned position said vanes in response to said overload signal of said detecting means.

5,183,384

FOLDABLE PROPELLER ASSEMBLY

Joe H. Trumbly, 197 Raft Island, Gig Harbor, Wash. 98335

Filed May 16, 1988, Ser. No. 194,510
Int. Cl.[5] B63H *1/06, 1/22*
U.S. Cl. 416—87 **2 Claims**



1. A folding propeller assembly suitable for attachment to a shaft for use in marine propulsion, comprising:

a propeller hub, said hub having a central axis of rotation and three slots each having opposing sides, said slots positioned such that the planes defined by the said slots intersect at equal angles;

three propeller blades, said blades comprising a propeller stem connected to a working face

a means of attaching said blades to said slots, wherein said last mentioned means further comprises a bolt positioned through said opposing sides of each of said slots,

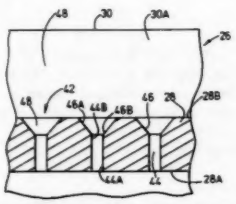
wherein said blades lie, when said hub is not rotating, in a plane substantially parallel to the said central axis of rotation, and such that when said hub is rotated about said axis, the centrifugal force caused by said rotation causes said propeller blades to extend to an angle that is effective so as to cause said blades to provide propulsion.

5,183,385

TURBINE BLADE SQUEALER TIP HAVING AIR COOLING HOLES CONTIGUOUS WITH TIP INTERIOR WALL SURFACE

Ching-Pang Lee, Cincinnati; Harold P. Rieck, Jr., West Chester; Nicholas C. Palmer, Loveland, and David G. W. Fargher, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 615,520, Nov. 19, 1990, abandoned. This application Feb. 10, 1992, Ser. No. 830,975
Int. Cl.[5] F01D *5/18*
U.S. Cl. 416—97 R **12 Claims**



1. In a turbine blade having an interior source of cooling air flow, opposite pressure and suction sides, and an end portion with a continuous peripheral edge, a squealer tip comprising:

(a) a peripheral wall connected to, extending around, and projecting from said peripheral edge of said end portion of said blade, said peripheral wall having an interior wall surface; and

(b) means defining a plurality of tip holes through said end portion of said blade in communication with said interior source of cooling air flow, said tip holes being spaced apart from each other and located contiguous with said interior wall surface of said peripheral wall along at least one of said pressure and suction sides of said turbine blade for providing effective diffusion cooling air flow from said tip holes on a portion of said interior wall surface along said at least one of said pressure and suction sides of said blade;

(c) said each tip hole including

(i) an inner portion having an inner end and an outer end and communicating with said interior source of cooling air flow of blade at said outer end, said inner hole portion along its axial extent from said outer end to inner end thereof having a cross-section with first and second orthogonal dimensions that are uniform, and

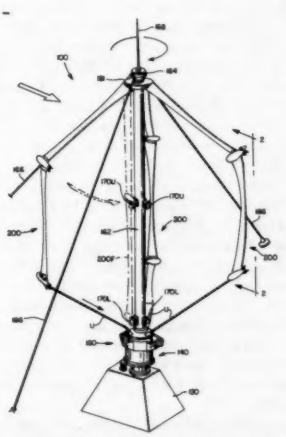
(ii) an outer portion having an inner end and an outer end and communicating between said inner end of said inner portion of said hole and a cavity defined by said blade end portion and said peripheral wall of said squealer tip, said outer portion having opposite sides defined by spaced interior surface portions, one of said interior surface portions being formed on said at least one side of said blade and extending in coplanar relation with said interior wall surface of said peripheral wall, the other of said interior surface portions being formed in said end portion of aid blade and spaced from said one interior wall portion and extending in generally parallel relation thereto and to said one interior wall portion such that said outer hole portion along its axial extent from said outer end to inner end thereof has a rectangular cross-section with a first dimension that is uniform and a second dimension orthogonal to the first dimension that decreases so as to define said outer hole portion overall as a rectangular trapezoid.

5,183,386

VERTICAL AXIS SAIL BLADED WIND TURBINE

Lewis Feldman, 2000 Valley Forge, Apt. 1233, King of Prussia, Pa. 19406, and Michael Concannon, R.R. #1, Port Dufferin, Nova Scotia, Canada B0J2RO

Continuation-in-part of Ser. No. 289,247, Dec. 23, 1988. This application May 30, 1989, Ser. No. 358,423
Int. Cl.[5] F03D *3/00*
U.S. Cl. 416—119 **13 Claims**



1. In a vertical axis turbine comprising a vertically extending, rotatable shaft; upper and lower blade attachment means for attaching at least one blade to said shaft, and a power absorbing load device coupled to said shaft; the improvement wherein said at least one blade comprises a flexible sail blade, made of fabric or film so as to have no substantial resistance to bending and thus to be limp under no load, and so that in

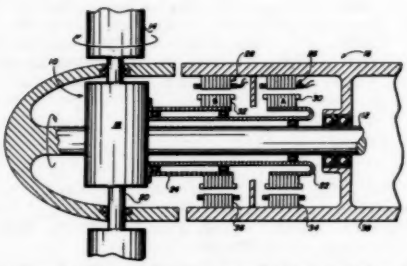
operation, said blade cambers inwardly towards the axis of rotation of the shaft when the blade is in an upwind position and cambers outwardly away from said axis of rotation when the blade is in a downwind position, and attached at the ends thereof to said shaft by said upper and lower blade attachment means and deployed and stabilized in operation by the centrifugal forces produced in response to rotation of said blades about the vertical axis of said shaft, whereby, in operation, aerodynamic forces acting on said sail blades can be transmitted to shaft without generating bending moments, said blade having at least one flyweight secured thereto.

5,183,387

FAULT-TOLERANT APPARATUS FOR CONTROLLING BLADE PITCH

Colin E. Huggett, and Kenneth L. Wuertz, both of Torrance, Calif., assignors to Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Jan. 3, 1992, Ser. No. 817,027
Int. Cl.[5] B63H *3/00, 3/06*
U.S. Cl. 416—147 **40 Claims**



39. Apparatus for controlling blade pitch of a variable-pitch turbofan engine having a turbine shaft and a plurality of output shafts, and mechanical actuator means for mechanically coupling said turbine shaft to said plurality of output shafts, said mechanical actuator means having first and second input shafts, said input shafts being rotated at the same speed by said mechanical actuator means when said turbine shaft is rotating, said mechanical actuator means rotating said output shafts in one direction when said turbine shaft is rotating and when said first input shaft is slowed relative to said second input shaft, said mechanical actuator means rotating said output shafts in an opposite direction when said turbine shaft is rotating and when said second input shaft is slowed relative to said first input shaft, each output shaft being coupled to at least one fan blade, said blade pitch being adjusted by rotating said output shafts about their longitudinal axes, said apparatus comprising:

a first induction machine having a first rotor secured for rotation to said first input shaft and a first stator held stationary with respect to said first rotor, said first stator having a first plurality of isolated windings;

a second induction machine having a second rotor secured for rotation to said second input shaft and a second stator held stationary with respect to said second rotor, said second stator having a second plurality of isolated windings; and

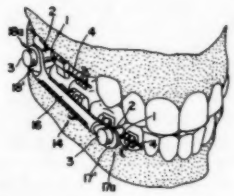
at least two controller means cooperating to provide excitation currents to selected windings of said first and second induction machines when said blade pitch is to be adjusted, each controller means being coupled to a corresponding phase winding in said first plurality and to a corresponding phase winding in said second plurality, wherein any one of said at least two controller means can excite said induction machines to adjust said blade pitch.

5,183,388

MOBILE HINGE MEMBER AND ORTHODONTIC APPLIANCE USING IT

Swadesh Kumar, Kongsvinger, Norway, assignor to Ortho-Dent, London, United Kingdom

PCT No. PCT/EP90/00523, § 371 Date Nov. 23, 1990, § 102(e) Date Nov. 23, 1990, PCT Pub. No. WO90/11731, PCT Pub. Date Oct. 18, 1990
PCT Filed Apr. 3, 1990, Ser. No. 623,396
Claims priority, application Norway, Apr. 6, 1989, 891420
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—19 **3 Claims**



1. An orthodontic appliance comprising

a rod unit having two ends;

a pair of bearing aperture forming means each connected to one of said ends, said bearing aperture forming means having a buccal surface and a tooth facing surface;

at least one hinge member to be received in one of said bearing aperture forming means, said hinge member including a substantially cylindrical shaft portion having a predetermined diameter, and a first end and a second end along a longitudinal axis;

head means on said first end, being larger in width than said predetermined diameter of said shaft portion when measured in normal direction to said longitudinal axis, said head means being integrally formed with said shaft portion; and

at least one opening within the range of said second end, said at least one opening extending across said longitudinal axis of said shaft portion;

said shaft portion and said head means being free of both inner and outer threads so as to enable connection with said rod unit by inserting said shaft portion into said bearing aperture forming means and retaining said shaft portion by inserting a wire into said at least one opening.

5,183,389

ANTI-ROCK BLADE TANG

Alan R. Gilchrist, Fairfield; Edward M. Duran; Dennis P. Dry, both of Cincinnati, all of Ohio, and Robert R. Berry, Portville, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 30, 1992, Ser. No. 828,278
Int. Cl.[5] F01D *5/30*
U.S. Cl. 416—193 A **6 Claims**

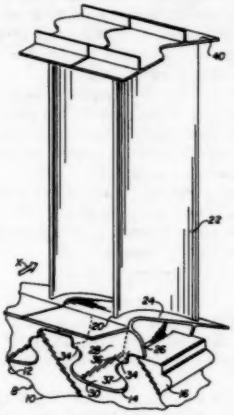
1. A rotor blade capable of being axially loaded in generally axially extending slots circumferentially disposed between adjacent posts in the rotor of a gas turbine engine, said blade comprising:

an airfoil radially extending outward from a blade platform,

a shank supporting said platform at a radially outward end of said shank,

said shank connected, at its radially inward end to an axially extending and axially linear single tang dovetail root that is effective for loading the rotor blade in the axial direction into the slots between the posts,

anti-rock tangs tangentially extending from said shank disposed between said platform and said root, and



said anti-rock tangs being linear in the axial direction, effective to engage the radially outwardmost facing surfaces of the corresponding post.

5,183,390

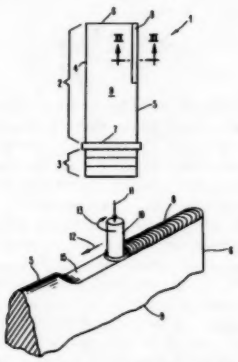
METHOD OF FORMING A TRAILING EDGE ON A STEAM TURBINE BLADE AND THE BLADE MADE THEREBY

Dennis R. Amos, Rock Hill, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 10, 1991, Ser. No. 727,748

Int. Cl.[5] B63H *1/26*

U.S. Cl. 416—224 **17 Claims**



12. A steam turbine blade having a root portion and an airfoil portion extending from said root portion, said airfoil portion having an edge portion and a center portion disposed adjacent said edge portion, said center portion formed from a first material, at least a first portion of said edge portion formed from a second material and bonded to said center portion, said blade made by a process comprising the steps of:

(a) placing a rotating rod formed from said first material in contact with said center portion;

(b) pressing said rotating rod against said center portion with an axial force, thereby plasticizing a portion of said rod adjacent said center portion, said rotating rod initially pressed against said center portion while simultaneously moving said rod approximately linearly relative to said center portion so that contact between said rod and said center portion is made with a running start; and

(c) moving said rotating rod approximately linearly along said center portion while maintaining said axial force, thereby consuming said rod and bonding said plasticized portion of said rod to said center portion, whereby said first portion of said edge portion is formed on said center portion.

5,183,391

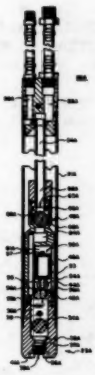
VALVE PUMP

Robert R. Fiedler, Lincoln, Nebr., assignor to Isco, Inc., Lincoln, Nebr.

Continuation of Ser. No. 621,075, Nov. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 522,679, May 11, 1990. This application May 6, 1992, Ser. No. 881,301

Int. Cl.[5] F04F *1/06*

U.S. Cl. 417—118 **3 Claims**



1. A purge pump comprising:

an enclosure;

means for applying gas under pressure to the enclosure;

pump inlet means for permitting the flow of liquid under ground from a well into said enclosure;

said pump inlet means including first check valve means whereby liquid is permitted to flow into said enclosure but not permitted to flow out of said enclosure;

conduit means for permitting liquid to flow out of said enclosure as gas is applied to said enclosure;

said conduit means including a conduit-means inlet portion;

said conduit-means inlet portion including liquid level sensing means for permitting liquid to flow from the enclosure into said conduit means when a substantial amount of liquid is within said enclosure;

said liquid level sensing means including second check valve means having a valve element, a valve seat and a valve housing;

said valve element having a density less than said liquid but more than said gas, whereby said valve element floats free of said valve seat in the presence of said liquid but not in the presence of said gas;

said conduit-means inlet portion including a conduit-means inlet opening and a third check valve means for permitting liquid to flow into said conduit means;

said conduit means extending between said enclosure and the surface of the ground;

said valve element including a nose part fitting within said valve seat;

a valve opening communicating with said conduit means and said valve housing;

a valve housing inlet opening communicating with said

enclosure and said valve housing wherein water and gas may flow from said enclosure into said valve housing;

the distance between the walls of the valve housing and valve element being between 8 thousandths inch and $\frac{1}{4}$ inch;

said valve housing inlet opening, valve opening and valve element being arranged with respect to each other so that the valve element is lifted sufficiently by the liquid before said valve element nose leaves said valve opening to avoid venturi effects from liquid flowing past the valve element between said valve housing inlet means and said valve opening;

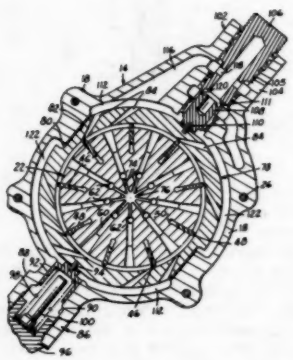
said conduit-means inlet opening connecting said first check val valve means and third check valve means wherein negative pressure between said second check valve means and third check valve means may pull said first check valve means from its valve seat whereby pressure is released that otherwise would tend to hold said first check valve means and third check valve means closed.

5,183,392

COMBINED CENTRIFUGAL AND UNDERVANE-TYPE ROTARY HYDRAULIC MACHINE

Lowell D. Hansen, Jackson, Miss., assignor to Vickers, Incorporated, Troy, Mich.

Filed May 19, 1989, Ser. No. 354,372
Int. Cl.[5] F04B *1/08, 23/10, 23/14*
U.S. Cl. 417—203 **15 Claims**



1. A combined centrifugal and vane-type rotary hydraulic pump that comprises:

a housing having a fluid inlet and a fluid outlet,

a rotor mounted for rotation within said housing, said rotor having a plurality of radially extending peripheral slots, an undervane chamber at a radially inner end of each said slot, and a plurality of internal passages extending radially through said rotor from an open outer end at a periphery of said rotor to an open inner end,

a plurality of vanes individually slidably mounted in said slots,

an annular track ring movably mounted within said housing, said track ring having a radially inner surface surrounding said rotor and forming a fluid cavity between said surface and said rotor,

a drive shaft coupled to said rotor and extending out of said housing,

fluid inlet passage means in said housing connecting said inlet to said open inner ends of said rotor passages such that fluid is centrifugally pumped through said rotor passages to said fluid cavity by rotation of said rotor and shaft,

fluid passage means to undervane inlet port means in said housing for connecting said fluid cavity to said undervane chambers in sequence as said rotor rotates within said housing,

fluid outlet passage means including first outlet port means in said housing spaced from said undervane inlet port means and connecting said fluid outlet to said undervane chambers in sequence as said rotor rotates within said housing, and second outlet port means connecting said outlet to said fluid cavity, and

means within said housing coupled to said ring and responsive to pressure of fluid fed to said outlet for adjustably positioning said track ring within said housing, and thereby controlling displacement of said vanes within said slots, as a function of outlet pressure,

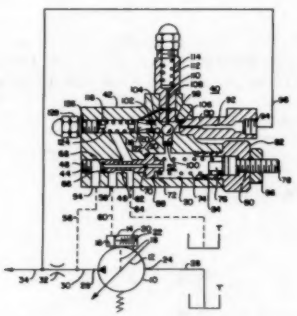
such that fluid pressure at said outlet varies as a combined function of piston pumping of said vanes through radial displacement in said slots and centrifugal pumping of fluid through said rotor passages.

5,183,393

POWER LIMITER CONTROL FOR A VARIABLE DISPLACEMENT AXIAL PISTON PUMP

Larey D. Schaffner, 7770 Witherspoon Dr., Baltimore, Ohio 43105

Filed Feb. 10, 1992, Ser. No. 832,965
Int. Cl.[5] F04B *1/26*
U.S. Cl. 417—218 **2 Claims**



1. A power limiter control for a variable displacement pressure compensated axial piston pump having an inlet and an outlet, a fixed orifice in said outlet for establishing a pressure differential proportional to outlet flow for the pump, a movable swash plate and a movable control piston attached to said swash plate for setting the displacement of the pump movable between a first control position of maximum pump displacement and a second control position of minimum pump displacement and spring means for spring biasing said control piston toward said first position which comprises:

a housing having a first bore for receiving a compensator metering piston, a tank port adapted to be connected to tank which opens into said first bore, an outlet pressure port adapted to be placed in fluid communication with the outlet of said pump which opens into said first bore, and a control port adapted to be connected to said control piston which opens into said first bore;

a compensator metering spool slideably received within said first bore having a metering land and movable between a first spool position in which said outlet pressure port is in fluid communication with said control port such that outlet pressure fluid is directed to said control piston to move said control piston toward said second control position, a second spool position in which said tank port is in fluid communication with said control port such that pressure fluid is drained from said control piston to enable said spring means to bias said control piston toward said

first control position and an intermediate position in which said control port is blocked by said land;

compensator spring means for biasing said compensator metering spool toward said second spool position mounted in said housing;

a flow port formed in said housing in fluid communication with the downstream side of said fixed orifice and with said metering spool;

a first fixed orifice in fluid communication with said outlet pressure port and said flow port which creates a first pressure differential across said metering spool which opposes the force of said compensator spring means to establish a minimum flow setting when said pump is operating;

a pressure responsive valve in fluid communication with said first fixed orifice and said flow port movable between a closed valve position in which fluid flow between said outlet pressure port and said flow port is prevented, a fully open valve position in which maximum fluid flow between said outlet pressure port and said flow port occurs such that said metering spool is exposed to the entire pressure differential across said fixed orifice in said outlet port and intermediate positions between said closed position and said fully open valve position;

second spring means for biasing said pressure responsive valve toward said closed valve position said spring means being set to maintain said pressure responsive valve in said closed position until said outlet pressure reaches a set maximum for said outlet pressure fluid at maximum set flow;

wherein said pressure responsive valve means moves to said intermediate positions when said outlet pressure reaches said maximum set pressure to modulate fluid flow between said outlet pressure port and said flow port to modulate the pressure differential across said metering spool to cause said metering spool to move between said first and second spool positions to move said control piston between said first and second control positions to thereby cause pump displacement to vary proportionally to outlet pressure to maintain a constant power output from said pump; and

pressure compensator means in fluid communication with said first fixed orifice to limit the maximum pressure of the fluid in said outlet.

5,183,394

SWASH PLATE TYPE COMPRESSOR WITH A CENTRAL INLET PASSAGE

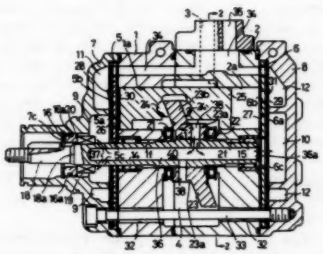
Toshiro Fujii; Hayato Ikeda; Ryo Katoh, and Hitoshi Inukai, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation-in-part of Ser. No. 863,814, Apr. 6, 1992. This application May 8, 1992, Ser. No. 880,574

Claims priority, application Japan, Oct. 5, 1991, 3-106020

Int. Cl.[5] F04B *27/08*

U.S. Cl. 417—269 **8 Claims**



1. A swash plate type compressor comprising:

a pair of cylinder blocks including a crank case and a plurality of cylinders connected to a suction port;

housing sections for covering said cylinder blocks, said housing sections including a suction chamber leading to each of said cylinders, and a discharge chamber also leading to each of said cylinders;

a drive shaft rotatably supported by said cylinder blocks, said drive shaft having a central axis, and a forward section for engagement to an external driving mechanism;

shaft sealing means disposed substantially within said suction chamber, for sealing said forward section of said drive shaft;

a swash plate mounted on said drive shaft and rotatably housed within said crank case;

a plurality of pistons housed within said cylinders, for engaging said swash plate;

a fluid passage provided along said central axis of said drive shaft, whereby fluid in said crank case is sucked into said cylinders via said suction chamber, and whereby the fluid is compressed in said cylinders and is discharged therefrom into said discharge chamber; and

a plurality of outlet and inlet ports leading to said fluid passage, said inlet ports being fluidly opened to said crank case and said outlet ports being opened to said suction chamber, said fluid passage, outlet ports and inlet ports forming a fluid suction passage.

5,183,395

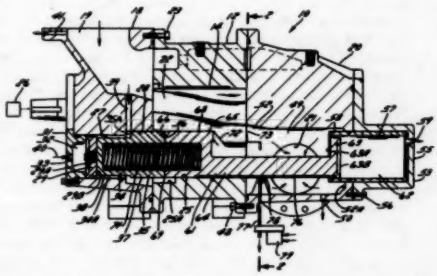
COMPRESSOR SLIDE VALVE CONTROL

Luc Langouet, Muskego, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Mar. 13, 1992, Ser. No. 850,583

Int. Cl.[5] F04B *49/00*

U.S. Cl. 417—310 **10 Claims**



1. A variable capacity rotary screw compressor comprising:

a rotor housing including a bore means having an inlet at a suction pressure, an outlet at a discharge pressure and a slide valve recess in fluid communication between said bore and said inlet;

a rotor means mounted for rotation in said bore means to compress a fluid received from said inlet and discharge said fluid at a higher pressure into said outlet;

a passive slide valve means and an active slide valve means mounted for movement in said recess either to a sealing position to prevent fluid communication through said recess or to positions defining a variable volume opening placing said bore means and inlet in fluid communication;

a passive slide valve balancing means connected to said passive slide valve means and including a first pressure activated means having inner and outer pressure responsive portions, said inner portion permanently connected in open communication with said suction pressure;

an active slide valve balancing means connected to said active slide valve means including a second pressure actuated means having inner and outer pressure responsive portions, said inner portion permanently connected in open communication with said discharge pressure;

a prime mover connected to selectively regulate the position of said active slide valve means; and

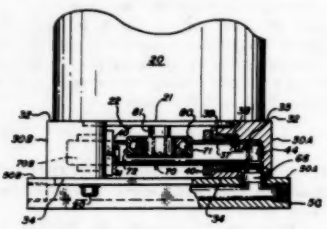
a control means operative to connect both of said outer portions of said first and second pressure activated means in fluid communication with either said suction pressure or said discharge pressure to counterbalance axial thrust on said active slide means with the use of either suction or discharge pressure and to activate said prime mover to regulate the position of said active slide valve means.

5,183,396

DOUBLE ACTING SIMPLEX PLUNGER PUMP

James E. Cook, 418 Rice St., Anoka, Minn. 55303, and O. Harald S. Eriksen, 6219 Zealand Ave., North Brooklyn Park, Minn. 55428

Filed Sep. 27, 1991, Ser. No. 766,323
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—534 **3 Claims**



1. A double acting simplex plunger pump comprising:

a) first and second unitary combined stuffing box and head members each member comprising (i) a unitary block having two spaced apart and parallel surfaces respectively designated a motor end face engaging surface and a pump manifold engaging surface, (ii) a recess in said block for receiving a cylindrically shaped plunger, said recess having a circular cross section and a longitudinal axis lying parallel to and in between said spaced apart parallel surfaces, (iii) a set of first and second pump port recesses in said block and each extending from said pump manifold engaging surface into said block and into connective relationship with said plunger receiving recess, and (iv) first and second check valve means respectively and reversely positioned in said first and second pump port recesses so that said first check valve means will admit fluid flow from said plunger recess and so that said second check valve means will admit fluid flow toward said plunger recess,

b) a manifold having a longitudinal axis, a bottom flat surface adapted to be abutted by said pump manifold engaging surfaces, first and second transversely spaced apart manifold inlet/outlet ports extending longitudinally therethrough from a first end to a second end and being mutually parallel to said longitudinal axis, and first and second longitudinally spaced apart sets of ports connecting said manifold inlet/outlet ports to said bottom flat surface,

c) plunger means comprising a shaft having a longitudinal axis and a preselected longitudinal length, first and second pumping means on the ends thereof, and a centrally located crank engaging means,

d) motor means having a planar axial end face, an output shaft rotatable about a shaft axis and extending axially from and perpendicular to said end face, and crank means on an end of said shaft, and

e) means connecting said members, said manifold, said plunger and said motor means, whereby: (i) said members are preassembled with said plunger means with said first and second pumping means of said plunger means being disposed in said plunger receiving recesses, (ii) said members are spaced apart along said plunger longitudinal axis a preselected longitudinal length, (iii) said motor end face engaging surfaces of said members are abutting said planar axial end face of said motor means, (iv) said pump manifold engaging surfaces of said members are abutting said bottom flat surface of said manifold, (v) said two sets of first and second pump port recesses of said members are respectively in register with said first and second longitudinally spaced apart sets of ports in said manifold, (vi) said check valve means are positioned partially in said sets of first and second pump port recesses of said members and partially in said longitudinally spaced apart sets of ports in said manifold and (vii) said crank means is operatively connected to said crank engaging means of said plunger means, whereby said check valves, positioned as aforesaid, provide structural linkages between said manifold and said members to thereby

(a) restrain said member against movement thereby along said plunger longitudinal axis, and

(b) provide a precision alignment and positioning of said members with respect to said planar axial end face of said motor means to assure that said longitudinal axes of said members are in mutual alignment to thereby accommodate and hold said plunger means so that the plunger longitudinal axis is perpendicular to said motor output axis.

5,183,397

DENTAL BONDING ARRANGEMENT AND METHOD

Bernard Weissman, 225 E. 48th St., New York, N.Y. 10017

Filed Sep. 20, 1989, Ser. No. 409,726
Int. Cl.[5] A61C *5/08*
U.S. Cl. 433—215 **14 Claims**

1. A dental bonding arrangement, comprising a film of viscous, self-supporting adhesive material, and a removable backing sheet on which the adhesive material is mounted, wherein said film is in the shape of a torroidal plug.

5,183,398

APPARATUS AND METHOD FOR INTERACTIVE INSTRUCTION OF A STUDENT

Charles Monte, Sepulveda; Norman A. Worthington, III, Woodland Hills; Jonathan Mandel, Chatsworth, and Gary F. Davenport, Claremont, all of Calif., assignors to The Software Toolworks, Novato, Calif.

Filed Jun. 1, 1990, Ser. No. 532,272
Int. Cl.[5] G09B *13/00, 15/00*
U.S. Cl. 434—227 **29 Claims**

1. An apparatus for instruction of a student which includes interactive guidance of the student through a series of lesson frames, each containing an instructional task for the student to complete, by comparing the student's performance to the task in the lesson frame with both a set of absolute performance responses and with acceptable performance responses for the task, comprising:

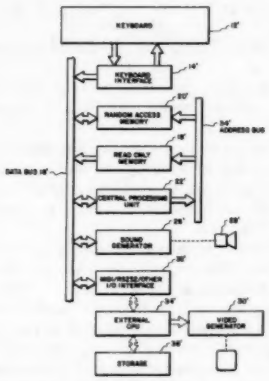
(a) keyboard means having a plurality of manually operable keys for generating at least one key relation signal in response to the actuation of each key, said key relation signal corresponding to and representative of a reference key number;

(b) storage means having a predetermined program contained therein, said program including a sequence of code signals representing a series of instructional frames, each

frame including 1) a first signal group of signals representing an instructional activity to which the student responds, with a first portion of said group corresponding to an audio display and a second portion corresponding to a video display, 2) a second signal group of signals associated therewith representing desired values for the student response to the activity corresponding to represent an acceptable achievement level, 3) a sequence of substantially perfect performance responses for said instructional activities presented in all of said frames;

(c) evaluator means connected to said keyboard means, and to said storage means, for generating for each said frame a performance signal representing the results of a comparison between said series of key relation signals and said performance responses, said evaluator means also generating for each frame a next frame selection signal representing a next frame that is discriminately selected as a result of a comparison between said performance signal and said second group of signals representing an acceptable achievement level for said associated instructional activity in each said frame;

(d) control means connected to said storage means and to said evaluator means for generating audio control signals and video control signals to present to the student both aurally and visually, the next instructional frame in accordance with said next frame selection signal generated by the last comparison;



(e) sound generator means connected to said control means for producing audible sounds in response to said audio control signals; and,

(f) video display means connected to said control means for producing a visually displayed image to the student response to said video control signals.

11. A method for instruction of a student which includes interactive guidance of the student through a series of lesson frames, each containing an instructional task for the student to complete, by comparing the student's performance to the task in the lesson frame with both a set of absolute performance responses and with acceptable performance responses for the task, comprising:

(a) providing keyboard means having a plurality of manually operable keys for generating at least one key relation signal in response to the actuation of each key, said key relation signal corresponding to and representative of a reference key number;

(b) providing storage means having a predetermined program contained therein, said program including a sequence of code signals representing a series of instructional frames, each frame including 1) a first signal group of signals representing an instructional activity to which the student responds, with a first portion of said group corresponding to an audio display and a second portion corresponding to a video display, 2) a second signal group of signals associated therewith representing desired values for the student response to the activity corresponding to represent an acceptable achievement level, 3) a sequence of substantially perfect performance responses for said instructional activities presented in all of said frames;

(c) providing evaluator means connected to said keyboard means, and to said storage means, for generating for each said frame a performance signal representing a next frame that is discriminately selected as a result of a comparison between said series of key relation signals and said performance responses, said evaluator means also generating for each frame a next frame selection signal representing the results of a comparison between said performance signal and said second group of signals representing an acceptable achievement level for said associated instructional activity in each said frame;

(d) providing control means connected to said storage means and to said evaluator means for generating audio control signals and video control signals to present to the student both aurally and visually, the next instructional frame in accordance with said next frame selection signal generated by the last comparison;

(e) providing sound generator means connected to said control means for producing audible sounds in response to said audio control signals; and,

(f) providing video display means connected to said control means for producing a visually displayed image to the student response to said video control signals.

5,183,399

DEVICE FOR TRAINING OF DIFFERENTIATION

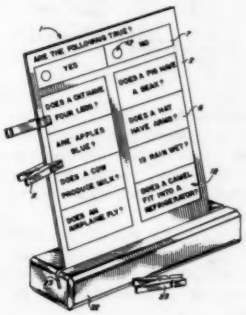
Heiner Muller, Dorfstrabe 14, D-2152 Horneburg, Fed. Rep. of Germany

Filed Dec. 18, 1990, Ser. No. 629,253

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1989, 8914825

Int. Cl.[5] **G09B** *3/00, 7/00*

U.S. Cl. 434—322 **8 Claims**


ARE THE FOLLOWING TRUE?
YES
NO
DOES A CAT HAVE FOUR LEGS?
DOES A PIG MAKE A MEAT?
ARE APPLES BLUE?
DOES A HAT HAVE HAND?
DOES A COW PRODUCE MILK?
IS RAIN WET?
DOES AN AIRPLANE FLY?
DOES A CAMEL FIT INTO A REFRIGERATOR?

1. A device for training of differentiation, comprising in combination:

a card having a front surface, a back surface, and a border edge, said front surface including a plurality of question symbols arranged in a first section and a plurality of proposed answer symbols arranged in a second section, each of said question symbols presenting a question to be answered, each said proposed answer symbols being colored differently and representative of different proposed answers to said questions, said back surface including correct answer symbols is alignment with said question symbols and being colored the same as one of the proposed answer symbols; and

a plurality of clamps having two portions for removable

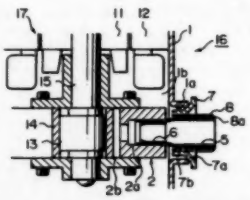
clamping on opposing sides of said card about said border edge and being colored the same as the colors of said proposed answer symbols, whereby the colors of said clamps represents proposed answers to said question symbols and, when one of said clamps is removably fastened over said border edge of said card in alignment with one of said question symbols on said front surface and with the corresponding said correct answer symbol on said back surface, whether such proposed answer is a correct or incorrect answer to said question symbol on said front surface can be readily visualized by comparing the color of said clamp to the color of the answer symbol of said back surface of said card.

5,183,400

PIPE CONNECTION STRUCTURE OF A COMPRESSOR

Takemi Tada; Hirosi Tanaka, and Osami Usui, all of Tochigi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1991, Ser. No. 746,629
Claims priority, application Japan, Sep. 7, 1990, 2-235628
Int. Cl.[5] F04B *21/00*
U.S. Cl. 417—572 **12 Claims**



1. A pipe connection structure of a closed type compressor of the type that has a casing, a compression mechanism section housed in the casing, an intake pipe member extending through a burring hole in the casing and being connected to an intake port of the compression mechanism section, the connection structure comprising:

an annular pipe insertion member airtightly connected to a peripheral edge of the burring hole; and

a tubular member fitted into an inner peripheral surface of the pipe insertion member and airtightly bonded thereto by brazing,

wherein the intake pipe member extends through the tubular member to the intake port and is airtightly bonded to the tubular member by welding,

a plurality of grooves are formed in one of the outer peripheral surface of the tubular member and the inner peripheral surface of the pipe insertion member over an entire circumference of both of the surfaces and the brazing material is received in the grooves,

each of the grooves has a length at least equal to an axial dimension of an area over which the pipe insertion member and the tubular member are engaged with each other, and

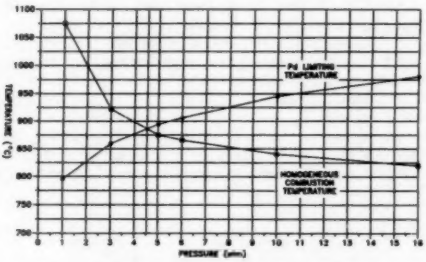
wherein each of the grooves has a depth ranging from 0.05 to 0.5 mm.

5,183,401

TWO STAGE PROCESS FOR COMBUSTING FUEL MIXTURES

Ralph A. Dalla Betta, Mountain View, Calif.; Nobuyasu Ezawa, Koto, Japan; Kazunori Tsurumi, Fujisawa, Japan; James C. Schlatter, Sunnyvale, and Sarento G. Nickolas, Livermore, both of Calif., assignors to Catalytica, Inc., Mt. View, Calif. and Tanaka Kikinzoku Kogyo KK, Japan

Filed Nov. 26, 1990, Ser. No. 618,301
Int. Cl.[5] F23D *3/40*
U.S. Cl. 431—7 **27 Claims**



1. A process for combusting combustible mixtures comprising the steps of:

a. mixing an oxygen-containing gas with a fuel at a relatively high pressure to form a high pressure combustible mixture,

b. contacting the high pressure combustible mixture in a first zone with a first zone combustion catalyst comprising palladium completely covering a catalyst support at reaction conditions sufficient to combust at least a portion but not all of the fuel,

c. contacting the partially combusted gas from the first zone in a second catalytic zone with a second zone combustion catalyst having heat exchange surfaces comprising a metallic support with walls having palladium catalyst applied to at least a portion of only one side and not the other side of the surface forming the walls of the catalyst support so as to limit the catalyst substrate temperature and bulk outlet gas temperature at reaction conditions sufficient to combust at least a further portion of the fuel and produce a mixture capable of supporting homogeneous combustion.

5,183,402

WORKPIECE SUPPORT

Michael J. Cooke, Thornbury, and Arthur J. McGeown, Bristol, both of England, assignors to ELECTROTECH Limited, Bristol, England

Filed May 14, 1991, Ser. No. 699,577
Claims priority, application United Kingdom, May 15, 1990, 9010833
Int. Cl.[5] F27D *5/00*
U.S. Cl. 432—5 **15 Claims**

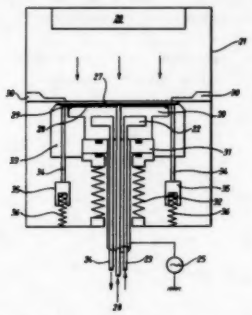
1. An apparatus for supporting a workpiece comprising:

an enclosure;

means for reducing the pressure within the enclosure;

a platen in the enclose for supporting a workpiece on a surface thereof, said surface of the platen having a coating for assisting heat transfer between the workpiece supported on the platen and the platen, said coating having an

emissivity not less than the emissivity of the workpiece; and



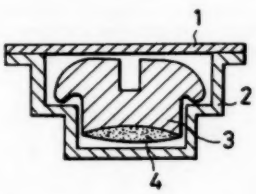
means for heating the workpiece supported on the platen to a temperature of at least 200° C., said workpiece having an emissivity not greater than that of said coating.

5,183,403

PROCESS FOR ADHESION OF ORTHODONTIC BRACKET

Eiichi Masuhara, Tokyo, and Shigeo Komiya, Urawa, both of Japan, assignors to Japan Institute of Advanced Dentistry, Tokyo, Japan

Filed Jun. 20, 1991, Ser. No. 718,397
Int. Cl.[5] A61C *3/00*
U.S. Cl. 433—9 **1 Claim**



1. A process for adhering an orthodontic bracket made of a light-transmitting material and having a photopolymerizable adhesive layered and fixed on a back surface portion thereof, said process comprising applying a liner which is a liquid mixture of polymerizable monomer containing as a catalyst one of an organic peroxide, a combination of an organic peroxide with a photochemical sensitizer and a combination of a reducing agent with a photochemical sensitizer to a tooth surface pretreated with an acid, pressing the orthodontic bracket against the tooth surface and irradiating the bracket with light.

5,183,404

SYSTEMS FOR CONNECTION OF PHYSICAL/ELECTRICAL MEDIA CONNECTORS TO COMPUTER COMMUNICATIONS CARDS

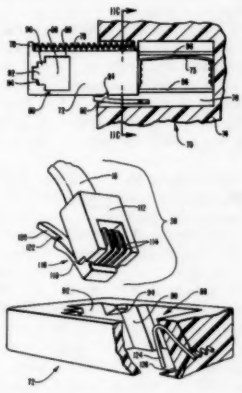
Stephen C. Aldous, Salt Lake City, and Guy M. Dake, Sandy, both of Utah, assignors to Megahertz Corporation, Salt Lake City, Utah

Filed Apr. 8, 1992, Ser. No. 866,670
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—55 **39 Claims**

1. A direct connection system for removably engaging a physical/electrical data transfer media connector in communication with a telephone data transfer line with a communications card, the system comprising:

(a) a communications card for use in a downsized computer, the communications card having a first outer surface and a second outer surface;

(b) an aperture formed in the communications card, the aperture having sides extending from the first outer surface to the second outer surface, the aperture being configured to receive at least a portion of the physical/electrical media connector;



(c) a contact wire located within the communications card extending through a side of the aperture, the contact wire being capable of making electrical contact with a the exterior of the physical/electrical media connector when positioned within the aperture; and

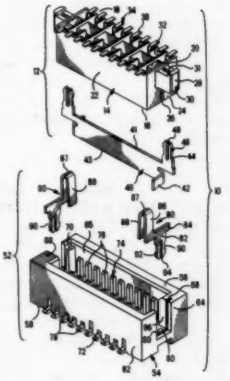
(d) means for selectively securing the physical/electrical media connector directly to the communications card.

5,183,405

GROUNDED ELECTRICAL CONNECTOR ASSEMBLY

Robert W. Elicker, Dillsburg, and Daniel L. Gorenc, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 20, 1991, Ser. No. 811,497
Int. Cl.[5] H01R *13/652*
U.S. Cl. 439—108 **10 Claims**



1. An electrical connector assembly comprising:

first and second matable connectors, each adapted to be mounted to respective first and second circuit boards and to interconnect respective circuits between said boards upon said connectors being mated to one another;

each of said first and second connectors includes an insulated housing having a base, opposed sidewalls opposed endwalls, a mating face, a board mounting face, and a plurality of terminal-receiving passageways extending between said mating and mounting faces, said passageways being arranged in at least two rows essentially parallel to said housing sidewalls; and

a plurality of electrical terminal members, each mounted within a respective terminal-receiving passageway in said at least two rows and defining parallel rows of terminal members, each terminal having a first connecting portion adapted to mate with a corresponding terminal member of said mating connector and a second connecting portion adapted to mate with circuits on the respective circuit board;

one of said first and second connectors further including an elongate electrically conductive ground bus means extending essentially parallel to said respective housing sidewalls, between said at least two rows of terminal members and securable to said housing proximate said endwalls thereof, said ground bus means including at least one first ground engagement means at an end thereof, said bus means end being proximate one of said endwalls, said ground bus means further including means for securing said respective housing to the associated one of said circuit boards and concomitantly therewith electrically interconnect said bus means to respective circuits of said one board;

said other of said first and second connectors includes at least one ground contact secured to only one of said respective endwalls of said other connector housing, said at least one ground contact including second ground engagement means adapted to electrically engage said first ground engagement means, said at least one ground contact further including means for insertion into an aperture of the other circuit board for securing said respective other housing to the associated other circuit boar and concomitantly therewith electrically interconnect said ground contact to ground means of the other of said circuit boards;

said first and second ground engagement means being exposed along respective mating faces to become engaged upon mating of said first and second connectors, said first and second ground engagement means being adapted to bear against each other under spring bias when said connectors are mated, whereby

upon mounting and securing said first and second connectors to said respective circuit boards and upon mating said mounted first and second connectors, said second connecting portions of said terminal members are electrically engaged with corresponding circuits of the associated circuit boards, corresponding ones of said first connecting terminal portions of said first and second connectors are electrically engaged and said ground bus means is electrically connected to said ground contact and ground means of said assembly.

5,183,406

BASEBOARD WITH MOVABLE ELECTRICAL OUTLET

Bryan D. Glen, 1846 West 14th Avenue, Vancouver, British Columbia, Canada V6J 2J9

Continuation-in-part of Ser. No. 499,703, Mar. 27, 1990, Pat. No. 5,052,937. This application Aug. 30, 1991, Ser. No. 752,877

The portion of the term of this patent subsequent to Oct. 1, 2008, has been disclaimed.

Int. Cl.[5] H01R *25/14*

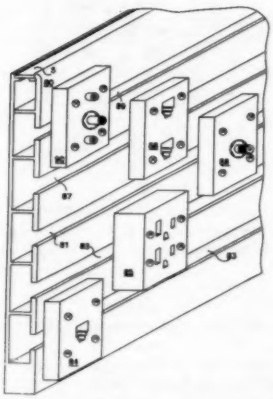
U.S. Cl. 439—120 **11 Claims**

1. An electrical distribution system comprising:

a) an elongated housing having a front panel defining a hollow interior, and a plurality of parallel elongated slots formed in said front panel, said front panel having an inner and outer surface;

b) a plurality of pairs of electrical conduction means fixed to the inner surface of said front panel, each pair of said conduction means being parallel to and spaced from one of said slots;

c) means for providing an electrical differential between each said pair of conduction means; and



d) a plurality of movable receptacle means for releasably engaging said housing, each receptacle means comprising a face having electrical receptacle means, means for releasably securing said movable receptacle to said housing and means for electrically engaging said conduction means, said conduction engaging means being adapted to engage said conduction means when one of said receptacle means is installed in one of said slots.

5,183,407

REUSABLE SAFETY CAP FOR BOOSTER CABLE

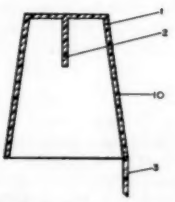
Karl Srol, R.R. 1, Gunn, Alberta, Canada T0E 1A0

Filed Nov. 5, 1991, Ser. No. 788,023

Claims priority, application Canada, May 6, 1991, 2041844

Int. Cl.[5] H01R *13/44*

U.S. Cl. 439—135 **2 Claims**



1. A reusable safety cap for exposed unprotected booster cable clamps having spring actuated clamping jaws, comprising:

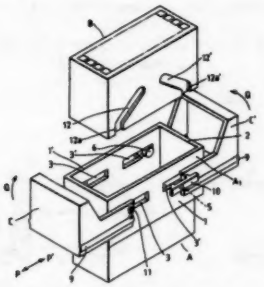
a cap shell with an internal gripping tab such that when the clamp is inserted into the cap shell the internal gripping tab is gripped by the spring actuated clamping jaws to maintain the clamp within the cap shell.

5,183,408

CONNECTOR WITH FITTING OPERATION CAM MEMBERS

Yuji Hatagishi, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Nov. 29, 1991, Ser. No. 800,103
Claims priority, application Japan, Nov. 30, 1990, 2-329502
Int. Cl.[5] H01R *13/44*
U.S. Cl. 439—147 **9 Claims**



1. A connector with fitting operation cam members, comprising:

a female housing having sliding guide slots formed in a hood portion thereof;

fitting operation cam means having drive projections, slidably mounted onto said female housing through said sliding guide slots; and

a male housing having slanting driven grooves which are formed in an outer surface thereof so as to respectively receive said driven projections, wherein fitting connection and disconnection of said female and male housings relative to each other are carried out by moving said fitting operation cam means;

said cam means comprising:

a pair of cam members each reciprocally movable between an end wall and an intermediate portion of said hood portion; each of said pair of cam members being of a bifurcated configuration having a pair of opposed arms and a rear plate interconnecting said pair of arms, each of said arms having said drive projection; and said cam members being angularly movably attached to said hood portion, whereby when said female housing is not in use, an opening of said hood portion is closed by said rear plates of said pair of cam members by turning said pair of cam members generally upright.

5,183,409

HERMAPHRODITIC MULTIPLE CONTACT CONNECTOR

Eric Clever, 29 Estaugh Ave., Haddonfield, N.J. 08033, and Ray Lyons, 989 Highland Ave., Parkland, Pa. 19047

Filed Apr. 15, 1991, Ser. No. 685,422
Int. Cl.[5] H01R *13/28*
U.S. Cl. 439—291 **17 Claims**

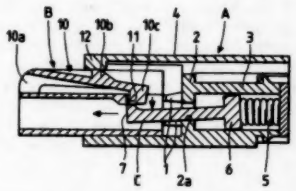
1. An electrical connection comprising a pair of identical hermaphroditic connectors, each said connector comprising a shell, a wiring face, at least two fingers, a space between said fingers, a said finger on one connector fitting into a space between said fingers on said other connector, at least one insulated conductor passing axially through said connector, equal portions of each insulated conductor extending longitudinally along each of said fingers, and each conductor being exposed the axial length of said finger, and each said conductor being exposed from the insulation along the axial length of each of said fingers to form an area for mating with the other connector of said pair and each said conductor being only partially circumferentially exposed from said insulation along the axial length of each of said fingers.

5,183,410

CONNECTOR ASSEMBLY

Shigemitsu Inaba, and Mitsuhiro Matsumoto, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 27, 1992, Ser. No. 858,846
Claims priority, application Japan, Apr. 1, 1991, 3-068212
Int. Cl.[5] H01R *3/00*
U.S. Cl. 439—489 **12 Claims**



1. A connector assembly, comprising:

a first connector housing including a striking member slidably disposed therein and having one end extending in a first direction, and a spring interposed between said movable striking member and a portion of said first connector housing for urging said striking member in said first direction; and

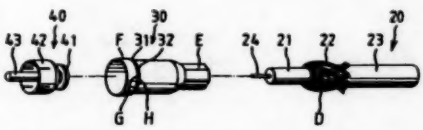
a second connector housing including a receiver for receiving said one end of said striking member such that said striking member is forced in a second direction, opposite said first direction, upon insertion of one of said connector housings into the other of said connector housings to compress said spring, wherein during engagement of said first and second connector housings, said striking member is disengaged from said receiver to cause said striking member to strike against said first connector housing forcing said first connector housing in said first direction.

5,183,411

COAXIAL CABLE

Jason Yu, Taipei, Taiwan, assignor to J. A. L. Taiwan Ltd., Taipei, Taiwan

Filed Aug. 6, 1992, Ser. No. 925,195
Int. Cl.[5] H01R *17/04*
U.S. Cl. 439—578 **4 Claims**



1. A coaxial cable comprising:

a coaxial wire having a central conductor, an outer conductor, an inner insulating layer between said central and outer conductors and an outer insulating layer covering said outer conductor, a section on a first end of said outer insulating layer being cut so as to expose said outer conductor and which is pulled toward a second end of said

insulating layer such that said outer conductor covers said first end of said outer insulating layer;

a hollow metal tube having an inner wall, a first end and a second end opposite to said first end, said second end being restricted to possess a polygonal wall surface so as to receive one end of said coaxial wire when said coaxial wire is inserted into said second end of said hollow metal tube wherein said outer conductor is in tight electrical contact with an inner portion of the polygonal wall surface, said hollow metal tube further having a stop member provided therein adjacent to said first end thereof;

a plug member having a central electric conducting blade, an annular electric conducting wall and an insulating material disposed between said central electric blade and said annular electric conducting wall, a first end and a second end opposite to said first end, said second end is inserted into said first end of said hollow metal tube such that said first and of said hollow metal tube being in electrical contact with said annular electric conducting wall of said plug member and said central electric conducting blade axially extends into said hollow metal tube and is in electrical contact with said central conductor of said coaxial wire while said stop member prevents said plug member from further moving into said metal tube, said first end of said plug member protruding out from said first end of said hollow metal tube, said plug member and said hollow metal tube being welded together; and

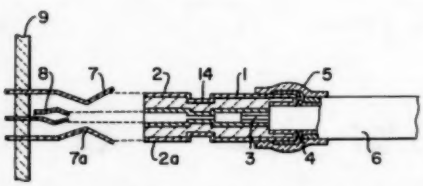
a plastic sleeve provided around said hollow metal tube.

5,183,412

CONNECTOR FOR COAXIAL CABLE

Toshiaki Nagafuji, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 16, 1992, Ser. No. 851,612
Claims priority, application Japan, Mar. 18, 1991, 3-52022
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 **5 Claims**



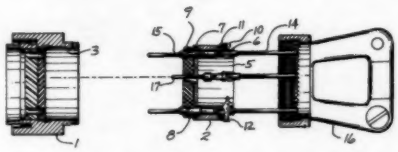
1. A connector for a coaxial cable comprising a cylindrical insulator having therein a through-hole in the core direction of a coaxial cable and metal-plated layers formed on the inner and outer surfaces of said insulator, wherein the inner conductor and outer conductor of said coaxial cable are electrically connected to the inner metal-plated layer and outer metal-plated layer of said insulator respectively.

5,183,413

MODULAR, CIRCULAR, ENVIRONMENT RESISTANT ELECTRICAL CONNECTOR ASSEMBLY HAVING RETENTION CLIPS FOR MANUALLY OR AUTOMATICALLY LOADING OF ELECTRICAL CONTACTS

Luis J. Lazaro, Jr., Seattle, and Franklin D. Harsch, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 588,117, Sep. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 454,213, Dec. 21, 1989, abandoned. This application Dec. 13, 1991, Ser. No. 807,620
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.
Int. Cl.[5] H01B *13/40*
U.S. Cl. 439—589 **6 Claims**



1. An electrical connector assembly comprising a shell adapted for connection to a grommet assembly in alignment therewith;

means associated with said shell and adapted for cooperation with said grommet assembly whereby to allow for their axial engagement and disengagement while preventing their rotation relative to each other;

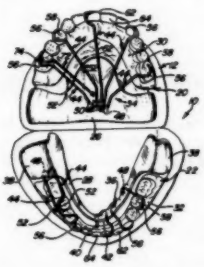
an environment resisting grommet elastomer having sealing webs with a minimum wire seal of 0.035 in. for No. 20 size electrical contacts and an insulating disc with a plurality of retention clips for assembly of electrical contacts mounted in said grommet assembly.

5,183,414

CANTILEVER DENTAL IMPLANT GUIDESTENT AND METHOD

Benjamin J. Czerniawski, 33204 Hampshire, Livonia, Mich. 48154

Filed Apr. 26, 1991, Ser. No. 691,713
Int. Cl.[5] A61C *3/02*
U.S. Cl. 433—76 **15 Claims**



1. A cantilevered surgical stent which is placed in a patient's mouth for permitting a surgeon to implant one of more endosseous dental implant fixtures in a desired orientation with respect to an edentulous ridge section of the patient's jawbone, said surgical stent comprising:

a base member positioned within the patient's mouth; and

guide means cantilevered from said base member for spatially orienting said dental implant fixture with respect to a predetermined reference point displaced from said eden-

tulous ridge including a guide wire having a first portion fixedly coupled to said base member, and a second portion adjacent said first portion which is cantilevered from said base member, said second portion including centering means for spatially locating said predetermined reference point with respect to said edentulous ridge section such that said predetermined referenced point defines the apex of a conical area having its base located at said edentulous ridge section, wherein the surgeon is able to apically select a desired drill trajectory with respect to said predetermined reference point for implantation of said dental implant fixture into said edentulous ridge section, said predetermined reference point being spatially positioned for approximating a desired incisal edge or occlusal table height from which a prosthesis can be fabricated that is in proper registry with opposing dentition.

5,183,415

Patent Not Issued For This Number

5,183,416

Patent Not Issued For This Number

5,183,417

CABLE BACKSHELL

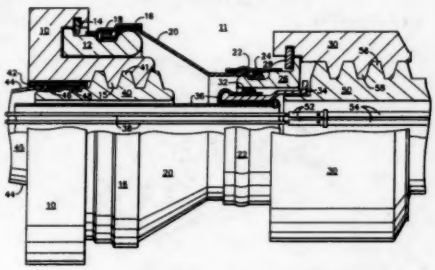
William G. Bools, Montgomery, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 11, 1991, Ser. No. 805,135

Int. Cl.[5] H01R *9/03*

U.S. Cl. 439—610 **2 Claims**

1. An electrical cable assembly comprising:
a first cable termination piece including a threaded portion;
a first backshell nut including a threaded portion adapted to mate with said threaded portion of said first cable termination piece;
a second backshell nut including a threaded portion adapted to mate with a threaded portion of a connector; and
a backshell cable shield;
a first backshell cable termination attached to said first backshell nut and freely rotatable with respect thereto, a first end of said backshell cable shield being affixed to said cable termination; and
a second backshell cable termination attached to said second backshell nut and freely rotatable with respect thereto, a



second end of said backshell cable shield being affixed to said cable termination.

5,183,418

CONNECTOR

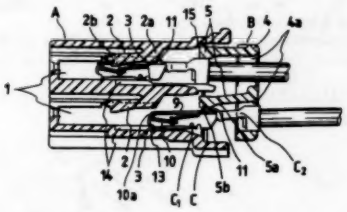
Makoto Yamanashi; Keishi Jinno; Tamio Watanabe; Takayoshi Endo, and Sakai Yagi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Sep. 30, 1991, Ser. No. 767,947

Claims priority, application Japan, Oct. 1, 1990, 2-260629; May 27, 1991, 3-37485

Int. Cl.[5] H01R *13/436*

U.S. Cl. 439—752 **7 Claims**



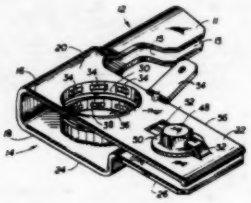
1. A connector comprising:
a metal terminal having an inverted insertion preventing protrusion between the front and rear ends thereof;
a connector housing including a plurality of terminal accommodating chambers each of which has a first flexible locking piece for locking said metal terminal; and
a terminal locking member engaged with said connector housing and movable between a temporary position and a final position, said terminal locking member having second flexible locking pieces provided for locking said metal terminals in said terminal accommodating chambers, respectively,
wherein each of said second flexible locking pieces has a locking protrusion at the free end, and wherein when said locking member is in said temporary position said locking protrusion engages with said inverted insertion preventing protrusion when said metal terminal is inserted upside down to prevent said metal terminal from being fully inserted within said connector housing.

5,183,419

BATTERY TERMINAL CONNECTOR

John H. Dewar, Grosse Ile, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Dec. 21, 1990, Ser. No. 632,296
Int. Cl.[5] H10R *11/26*
U.S. Cl. 439—765 **19 Claims**



1. A battery post connector comprising

a base portion for attachment to an electrical conductor,

a contact portion for engaging a battery post, said contact portion comprising

a first wall member having a first aperture for receiving a battery post, said first aperture being in a first plane, and,

a second wall member having a second aperture for receiving a battery post, said second aperture being in a second plane, said second wall member being spaced from said first wall member with said first and second apertures being aligned for receiving a battery post therethrough, and

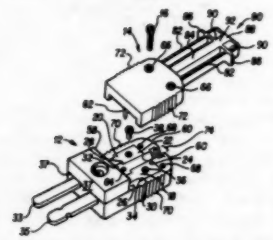
means for drawing said first wall member said second wall member to clamp the battery post connector to a battery post, said first and second planes being in nonparallel disposition when said first wall member is drawn toward said second wall member to clamp the battery post connector to a battery post.

5,183,420

MOLDED CONNECTOR WITH SPOOL

Milton B. Hollander, Stamford; David R. Jacobs, Norwalk, and William E. McKinley, Stamford, all of Conn., assignors to Omega Engineering, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 527,933, May 24, 1990, abandoned. This application Jun. 28, 1991, Ser. No. 723,448
Int. Cl.[5] H01R *13/58*
U.S. Cl. 439—457 **4 Claims**



1. An electrical connector, for coupling to the end of a flexible electrical cable having at least one electrical conductor for engagement with a mating connector, comprising:

an elongate housing, having a contact-supporting body portion of insulating material at one end thereof, and a cable-supporting body portion at the other end thereof separably attached to said contact-supporting body portion;

said contact-supporting body portion having a mating face for engaging a mating face on said cable-supporting body portion;

said cable-supporting body portion having a mating face lying in overlapping relationship with the mating face on said contact-supporting body portion;

each of said mating faces being generally parallel to the length of said housing, and at least one of said mating faces having a recess therein forming an exit passage for extending a conductor between said mating faces to the exterior of said housing;

said contact-supporting body portion having contact-exposing face with an opening therethrough for exposing a contact;

an electrical contact element supported on said contact-supporting body portion, and having a mating portion exposed through the opening in said contact exposing face;

coupling means on said contact-supporting body portion accessible at said mating face for coupling an electrical conductor to said electrical contact;

said cable-supporting body portion having a spool portion extending along the length thereof for winding an electrical cable thereon, and having an opening therein substantially transverse to the length of said housing through which the end of an electrical cable may be inserted to provide strain relief for resisting separation of said cable from said housing;

said spool portion having a longitudinal groove therein providing a path for a conductor along at least a portion of the length of said spool portion; and

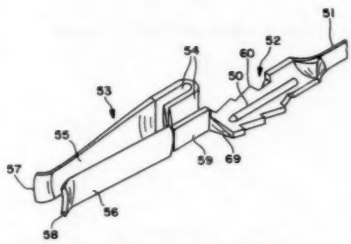
capstan means on said cable-supporting body portion adjacent to said opening and extending in overlying, spaced relationship thereto for limiting withdrawal of a cable from said opening.

5,183,421

CONNECTOR CONTACT AND METHOD OF MANUFACTURE

Mercury Yin, Hsin Tien, Taiwan, assignor to Foxconn International, Inc., Sunnyvale, Calif.

Filed Jul. 24, 1991, Ser. No. 734,886
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—857 **15 Claims**



4. A connector contact structure comprising:

a terminating section **(51)** formed at one end of the contact structure **(31)**, said terminating section **(51)** being adapted to connect to a PC board or conductor;

a mating section **(36)(53)** formed at the other end of the contact structure, said mating section **(36)(53)** including a U-shaped bending section **(54)** having spaced leg oprtions and a pair of cantilever arms **(55,56)** extending integrally from and constituting longitudinal extensions of said spaced leg portions facing each other and a pair of divergent receiving ends **(57,58)** extending outwardly therefrom to define a receiving opening, said U-shaped bending section opening in the same direction as said receiving opening;

a retention section **(52)** formed integrally between the terminating section **(51)** and said mating section **(36)(53)**, said retention section **(52)** being adapted to retain the contact inside an insulator body **(32)**; and

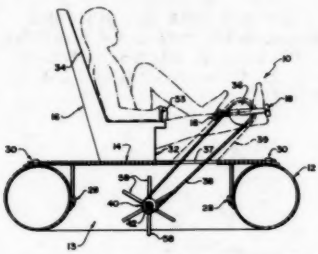
a stop **(59)** adapted to act against one of said leg portions of

said U-shaped bending section to restrict the displacement of the associated cantilever arm to ensure adequate contact pressure with a mating connector.

5,183,422
PEDAL BOAT

Thomas Guiboche, 4-301 Marion Street, Winnipeg, Manitoba, Canada R2H 0V1

Filed Mar. 12, 1992, Ser. No. 851,028
Int. Cl.[5] B63B *35/72*
U.S. Cl. 440—26 **6 Claims**

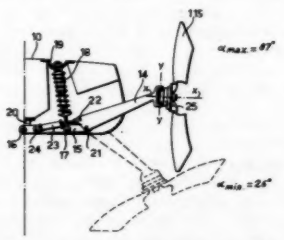


1. A boat comprising an inflatable annular tube, with a central opening therethrough, a rigid platform mounted on the tube so as to bridge the central opening, seating means mounted on the platform for receiving an occupant seated thereon, a set of pedals mounted on the platform, hand actuatable lever means mounted on the platform for steering the boat, said seating means positioned to allow the occupant to operate said set of pedals with the feet of the occupant and said means for steering with at least one hand, a transverse axle means located below the platform and within the said opening, means mounting the axle means for rotation about an axis transverse to the opening, means for communicating driving rotation from the set of pedals to the axle means, a first and a second paddle member mounted for rotation about said axis each mounted adjacent a respective one of two opposed ends of the axle means, first and second clutch means each actuatable to communicate drive from said axle means to a respective one of said paddle members, and means connecting said means for steering to each of said clutch means to provide a steering action by selectively driving said respective paddle member.

5,183,423
PROPULSION SYSTEM FOR SPEEDBOATS

Carlo Alinari, Via Monte Penna 6, 55043 Lido Di Camaiore, Italy

Filed Oct. 9, 1991, Ser. No. 773,274
Claims priority, application Italy, Oct. 10, 1990, 17711 A/90
Int. Cl.[5] B63H *5/06*
U.S. Cl. 440—53 **7 Claims**

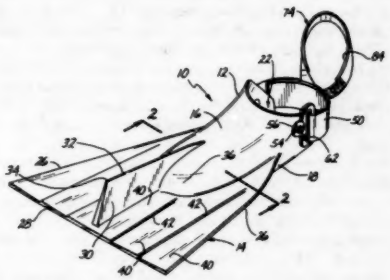


1. A propulsion system for speedboats, comprising a series of large screw propellers each having a plurality of blades under the hull, the planes of rotation of the propellers being substantially parallel to the direction of travel of the boat and inclined to the horizontal surface of the water at an angle of between 0° and 90°, wherein the propellers are connected to the hull by means of damped resilient suspensions.

5,183,424
SWIMMING FLIPPER

John D. Field, 8 Hodgson St., Crescent Head, New South Wales, Australia 2440

Division of Ser. No. 755,105, Sep. 5, 1991, abandoned. This application Mar. 13, 1992, Ser. No. 851,277
Int. Cl.[5] A63B *31/12*
U.S. Cl. 441—64 **11 Claims**



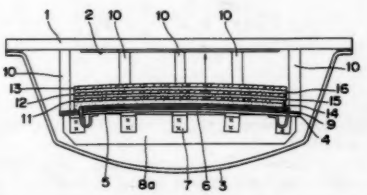
1. A swimming flipper comprising:

a foot receiving shoe portion defining a foot pocket, a rear entry opening into said foot pocket, and a flipper blade attached to said shoe portion, foot retaining strap means attached to said shoe portion for retaining a swimmer's foot against withdrawal from said entry opening when the flipper is worn on a swimmer's foot, said strap means comprising a heel strap adapted to loop behind the heel of the swimmer's foot and an ankle strap adapted to loop around the ankle of the swimmer's foot above said heel strap for securing the flipper against separation from the foot in the event said heel strap slips from the foot, said ankle strap having an end attached to said heel strap, and an opposite free end provided with fastener means for releasable attachment to said heel strap.

5,183,425
FLAT PICTURE DISPLAY DEVICE

Tetsuya Shiratori, Neyagawa; Fumio Yamazaki, Hirakata, and Seiichi Taniguchi, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 615,010, Nov. 19, 1990. This application Feb. 11, 1992, Ser. No. 833,723
Claims priority, application Japan, Nov. 17, 1989, 1-3000512; May 31, 1990, 2-143119
Int. Cl.[5] H01J *9/18*
U.S. Cl. 445—29 **1 Claim**



1. A method of manufacturing shape retention structure for retaining filament electrodes of a flat picture display device in

a predetermined curved shape, said method comprising the steps of:

placing a shape retention plate on a concave outer surface of a mold, the concave surface having a predetermined curvature;

forcing said shape retention plate under pressure into contact with the concave outer surface of the mold so as to conform to the predetermined curvature thereof;

securing a plurality of rows of equal numbers of fixtures to a surface of the shape retention plate, opposite the surface thereof which contacts the concave outer surface of the mold in said step of forcing, in such a manner that the fixtures of each said row are spaced from one another in a first direction corresponding to the direction in which the outer concave surface of the mold is curved and in such a manner that the rows of fixtures are spaced from another in a second direction perpendicular to said first direction;

while the shape retention plate is conformed to the predetermined curvature of the outer surface of the mold, connecting first elongate reinforcement plates, equal in number to the number of said rows of fixtures, to the shape retention plate via said fixtures in such a manner that said first elongate reinforcement plates extend in said first direction;

while the shape retention plate is conformed to the predetermined curvature of the outer surface of the mold, connecting second elongate reinforcement plates, equal in number to said number of fixtures in each row thereof, to said shape retention plate in such a manner that said second elongate reinforcement plates extend across said first elongate reinforcing plates in said second direction without being rigidly connected to said first elongate reinforcement plates at those locations where the reinforcing plates cross, whereby the reinforcing plates constitute a grid-like structure secured to the shape retention plate; and

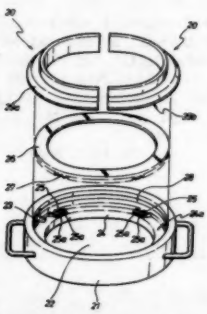
subsequently removing the shape retention plate and the grid-like structure secured thereto from the mold.

5,183,426

SHADOW MASK STRETCHING APPARATUS FOR FLAT CATHODE RAY TUBE

Cho Ho-jin, Seoul, and Sang-sin Choi, Anyang, both of Rep. of Korea, assignors to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

Filed Feb. 27, 1991, Ser. No. 660,607
Int. Cl.[5] H01J *9/236;* **B23P** *11/02*
U.S. Cl. 445—68 **2 Claims**



1. A shadow mask stretching apparatus for a flat cathode ray tube comprising:

an annular frame having a clamping lane projecting radially inward, said clamping lane having a plurality of projections respectively formed on a surface thereof; and

clamping means for clamping a shadow mask to said frame to stretch the shadow mask within said frame, said clamping means comprising an annular clamping pad having a surface with a contour abuttingly compatible to the contour of the surface of said clamping lane, and fixing means for fixing said clamping pad to said frame, said shadow mask being clamped between said surfaces of said clamping lane and said clamping pad, wherein:

said frame comprises an annular groove formed along an inner surface above said clamping lane; and

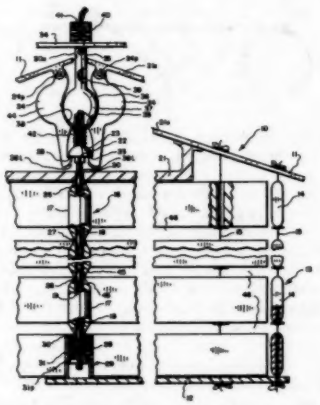
said fixing means comprises a plurality of C-shaped clamping rings having a plurality of flanges elastically insertable into said groove.

5,183,427

COLLAPSIBLE TOY BUILDING

A. Allen Draper, 3860 S. Midland, Roy, Utah 84067

Filed May 20, 1992, Ser. No. 885,832
Int. Cl.[5] A63H *33/00;* **F41J** *5/00*
U.S. Cl. 446—4 **6 Claims**



1. A toy simulated collapsible building actuated by impact of a toy projectile, comprising:

a base;

a vertical column member upstanding from the base;

a simulated roof structure having outside edges and supported by the column member upwardly from the base; wherein

the column member comprises at least two elongate segments stacked vertically end upon end from the base to the roof structure, each column segment having a central vertical bore therethrough;

a generally flexible cord installed passing sequentially through the segment bores, secured to the base through spring means urging the cord downwardly, and to the roof structure through releasable, reattachable, cord securing means opposing downward movement thereof;

means permitting lifting force to be exerted from above the roof upon the upper end of the column cord;

stiffening means carried by the cord at least at each segment-to-segment interface, substantially preventing relative rotation of the abutting segments out of vertical alignment;

impact actuated means releasing the cord securing means at the roof structure so that the cord is urged downwardly within the segment bores by the spring means at the base of the cord, simultaneously shifting the cord stiffening means downwardly away from all column segment interfaces, so that the column segments may rotate relatively out of vertical alignment at each interface, leading to instability of the column and building collapse; wherein

the cord remains threaded through the segment bores and connected to the roof structure during and after building

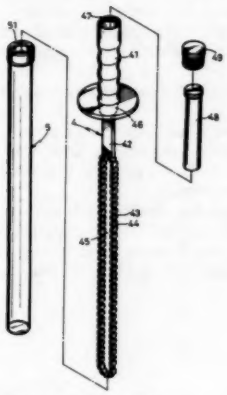
collapse, so that the building may be re-erected by applying lifting force upon the cord from above the roof structure, and reattaching the cord to the cord securing means at the roof structure.

5,183,428

BUBBLE BLOWING TOY

Mon S. Lin, No. 195, Chieng-Kou Road, Hsintien City, Taipei Hsien, Taiwan

Filed Dec. 11, 1991, Ser. No. 804,750
Int. Cl.[5] A63H *33/28*
U.S. Cl. 446—15 **4 Claims**



1. A bubble blowing toy comprising:

a) a body in substantially the configuration of a sword defined by a grip portion and a blade portion;

b) a first container in substantially the configuration of a scabbard for containing a soap solution and slideably receiving the blade portion therein;

c) the blade portion being partially define by an oblong shaped ring element provided with a plurality of recesses spaced therealong for absorbing the soap solution;

d) plug means carried by the body for insertion within the first container and sealing the soap solution therein when the blade portion is fully received within the first container; and

e) wherein the body may be used for either blowing larger bubbles by swinging the body through the air or blowing smaller bubbles by blowing through the ring element with the mouth.

5,183,429

CHILDREN'S TOY AND BOTH SOAP ASSEMBLY

Mary K. Bitton, 18433 Hatheras St. #508, Tarzana, Calif. 91356

Filed Jul. 31, 1991, Ser. No. 738,338
Int. Cl.[5] A63H *33/00, 3/00*; C11D *17/00*
U.S. Cl. 446—73 **14 Claims**

1. A child's toy and soap assembly comprising:

a waterproof toy having a predetermined irregular three dimensional configuration and predetermined minimum and maximum dimensions;

a body of transparent soap directing engaging and entirely encompassing and encapsulating said waterproof toy, said body of soap having a thickness from its exterior surface to the toy which is less than said maximum dimension in at least one area;

a transparent soap container having a configuration which is matched to the configuration of said body of soap;

said body of soap substantially filling said container;

said soap container being either clear or colored;

said body of soap having an exterior configuration substantially conforming to or complementing the configuration of the encapsulated toy;

said body of transparent soap and said transparent soap container structured such that the entire waterproof toy is

directly visible within said body of soap and transparent soap container; and

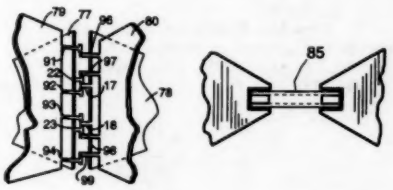
the shape of said soap container conforming to the shape of said toy.

5,183,430

GEOMETRIC TOY CONSTRUCTION SYSTEM

James Swann, 7347 S. Paxton, Chicago, Ill. 60649

Continuation-in-part of Ser. No. 856,366, Apr. 28, 1986, abandoned. This application Mar. 27, 1989, Ser. No. 328,932
Int. Cl.[5] A63H *33/08*
U.S. Cl. 446—104 **26 Claims**



1. A geometric toy construction system, said system comprising:

first and second groups of substantially flat, substantially planar construction pieces, each of said first-group and second-group construction pieces terminating at three or more straight edges;

means formed on said edges for selectively connecting and disconnecting said first-group pieces one to another, said second-group pieces one to another, and said first-group pieces to said second-group pieces,

said connecting means including one or more pairs of arms integral with and extending outwardly from any one of said construction pieces,

each of said arms having a body generally perpendicular to one of said construction pieces, said body terminating in a pair of protuberances extending perpendicularly from said body to define each of said arms as generally T-shaped,

said connecting means further including one or more pairs of posts integral with and extending outwardly from and generally perpendicular to any one of said construction pieces,

each of said posts having at least one socket formed thereon sized to fit one said protuberance in a rotatable fit,

a pair of said arms positioned symmetrically about the center point of any said edge identified as a "plus connector set", and a pair of said posts positioned symmetrically about the center point of any of said edges identified as a "minus connector set",

each of said edges of said first-group pieces having either a

first plus connector set or a first minus connector set formed thereon,

each of said edges of said second-group pieces having either second and third plus connector sets, or second and third minus connector sets formed thereon,

the arms in said first plus connector set are a third standard distance apart,

the posts in said first minus connector set are a second standard distance apart,

the arms in said second plus connector set are a first standard distance apart,

the posts in said second minus connector set are a fourth standard distance apart,

the arms in said third plus connector set are a fifth standard distance apart,

the minus posts in said third minus connector set are a sixth standard distance apart,

said first, second, third, fourth, fifth and sixth standard distances increase progressively in length from said first to said sixth,

said first, second, third, fourth, fifth and sixth standard distances being selected to enable the interconnection of a first plus connector set with a first minus connector set, a second plus connector set with a first minus connector set, a first plus connector set with a second minus connector set, and a third plus connector set with a third minus connector set, thereby allowing the interconnection of said first-group and second-group construction pieces about a common axis.

5,183,431

TOY FACSIMILE MACHINE

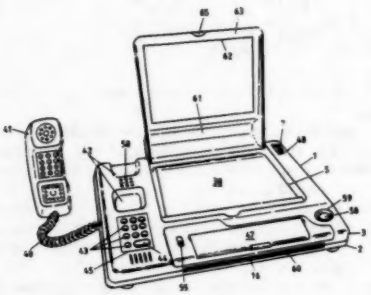
Masatoshi Todokoro, Matsudo, Japan, assignor to Staff Co., Ltd., Tokyo, Japan

Filed May 8, 1991, Ser. No. 697,636

Claims priority, application Japan, Jun. 5, 1990, 2-5885

Int. Cl.[5] A63H *33/30, 29/22;* **H04M** *11/00*

U.S. Cl. 446—142 **15 Claims**



1. A toy facsimile machine, comprising:

a hollow case having the external appearance of an operable facsimile machine;

a take-up shaft rotatably mounted within said hollow case;

said take-up shaft adapted to support an elongate sheet of recording paper disposed in rolled relation thereabout;

a pair of rotatably-mounted transfer roll members, also positioned within said hollow case, for frictionally engaging a leading end of said recording paper so that rotation of said transfer roll members causes said recording paper to unroll from said take-up shaft, a first transfer roll member contacting a lower side of said recording paper and a second transfer roll member contacting an upper side thereof;

said take-up shaft being positioned in a rearward part of said hollow case and said transfer roll members being positioned in a forward part thereof;

a delivery port formed in said hollow case in said forward part thereof, said delivery port having a size sufficient for said recording paper to pass through when said transfer roll members are rotated so that said recording paper is delivered to the environment external to said hollow case when said transfer roll members are rotated;

a cutting means disposed adjacent said delivery port for cutting said recording paper;

a window frame means formed in said case to expose a predetermined area of said recording paper to an individual playing with said toy;

a handset seat formed in said case;

a model handset selectively positionable in said handset seat;

a group of push buttons positioned on an upper surface of said hollow case so that said individual playing with said toy may manipulate said push buttons;

a motor means for effecting rotation of said transfer rolls;

a speaker means positioned in close proximity to said handset seat;

an integrated circuit connotatively coupled to said speaker means;

said integrated circuit adapted to generate a plurality of distinct tones in response to manipulation of said push buttons, there being a different tone associated with each of said push buttons;

a battery means for supplying power to said motor means, said integrated circuit, and said speaker means; and

a plurality of switch means for activating said motor means, said integrated circuit, and said speaker means.

5,183,432

FLOATING BODY OF SOPHISTICATED SHAPE PRODUCED FROM A SINGLE SHEET OF FILM WITH A SINGLE SEALING

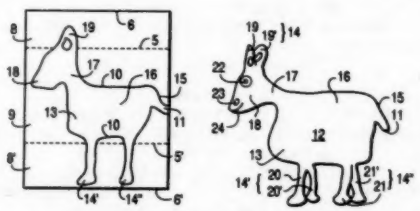
Tatsuo Noguchi, Osaka, Japan, assignor to Nihonmatai Co., Ltd., Tokyo, Japan

Division of Ser. No. 268,477, Nov. 7, 1988, Pat. No. 5,017,254. This application Nov. 14, 1990, Ser. No. 612,498

Claims priority, application Japan, Mar. 19, 1988, 66-66368; May 2, 1988, 63-109784

Int. Cl.[5] A63H *3/06;* **B32B** *31/00*

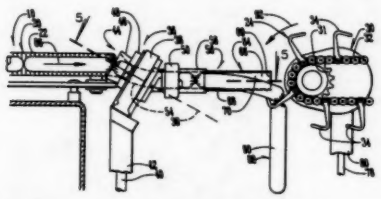
U.S. Cl. 446—220 **7 Claims**



1. A floating body comprising a first swelling portion having a gas inlet port through which gas is introduced and a plurality of second swelling portions each being held in fluid communication with said first swelling portion,

said first and second swelling portions being formed by folding a single multi-layer film to form a nonpleat portion corresponding to said first swelling portion and pleat portions corresponding to said second swelling portions and by sealing the folded multi-layer film along a continuous seal line which extends over both said pleat and nonpleat portions and forms said gas inlet port in said nonpleat portion.

5,183,433
SAUSAGE ENCASING MACHINE HAVING AN IMPROVED LOOPER HORN
Ray T. Townsend, Des Moines, and Vincent L. Basile, II, West Des Moines, both of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa
Filed Feb. 12, 1992, Ser. No. 836,072
Int. Cl.[5] A22C 11/00
U.S. Cl. 452—51 7 Claims

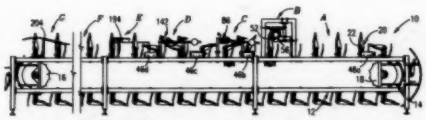


1. An improvement in a sausage encasing machine comprising means for creating an elongated strand of encased linked sausages along a substantially longitudinal and horizontal flow path, the improvement comprising,

a looper horn on said machine mounted to be in communication with said horizontal flow path to receive said strand,

connecting means rotatably securing said looper horn for rotation with respect to said machine about a rotational axis that extends downwardly from said connecting means, whereby said looper horn will be rotated from a substantially horizontal position of maximum elevation through a circular continuous arc which is located below said position of maximum elevation whereby said strand will never have to be moved in an upwardly inclined direction as it passes through said looper horn.

5,183,434
METHOD AND APPARATUS FOR REMOVING THE SKIN FROM POULTRY CARCASSES
Donald J. Scheier, Kansas City, Mo., and Jack L. Hathorn, Springdale, Ark., assignors to Johnson Food Equipment, Inc., Kansas City, Kans.
Filed Jul. 3, 1991, Ser. No. 725,181
Int. Cl.[5] A22B 5/16
U.S. Cl. 452—131 43 Claims



1. In a method of removing the skin from a poultry carcass, the improvement comprising:

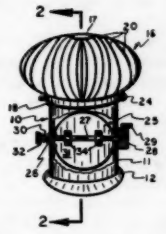
removing the tail and wings from the carcass;

directing an air stream under the back skin of the carcass and slitting the back skin along the backbone;

directing an airstream under the breast skin of the carcass and slitting the breast skin in a longitudinal direction along the breast to present two opposite half sheets of skin on the carcass bounded by the slits along the backbone and breast of the carcass; and

peeling the two half sheets of skin away from the carcass generally toward the thighs of the carcass to expose the meat therebeneath.

5,183,435
SEASONAL ATTIC TURBINE VENTILATOR
Bennie R. Galvez, 4604 Lindale Dr., Wichita Falls, Tex. 76310
Filed Jan. 13, 1992, Ser. No. 820,195
Int. Cl.[5] F24F 7/02
U.S. Cl. 454—18 3 Claims



1. In a rooftop-mounted turbine fan attic ventilator comprised of:

a) a duct having a circular cylindrical sidewall centered upon a vertical axis, a flanged lower extremity adapted to lie flush against an underlying roof, an interior region bounded in part by said sidewall, and an upper extremity having a horizontally oriented bearing collar, and

b) a turbine fan having an annular lower rim and a multiplicity of vertically oriented fins, said turbine fan being mounted upon said duct in overlying juxtaposition wherein said annular rim is concentrically disposed with respect to said bearing collar in close juxtaposition therewith,

the improvement comprising:

a) diametrically opposed locking apertures in said annular rim and diametrically opposed locking bores in said bearing collar, said apertures and bores adapted to be linearly aligned by means of rotative orientation of said fan relative to said duct,

b) an elongated locking pin adapted to be inserted through said aligned locking apertures and bores, thereby securing said fan from rotation relative to said duct, and

c) butterfly valve damper means comprised of:

1) diametrically opposed holes in said cylindrical wall,

2) a elongated shaft having a proximal extremity that penetrates one of said holes and having lever rotating means, and a distal extremity that penetrates said opposed hole,

3) a circular damper panel attached to said shaft along the diameter of said damper panel, thereby enabling said damper panel to rotate within said interior region in close conformity with said cylindrical wall, and

4) spring means acting between said distal extremity and said sidewall, thereby maintaining said damper panel in either vertical or horizontal orientation responsive to adjustment force applied to said lever rotating means, said vertical and horizontal orientations corresponding to open and closed conditions, respectively, of said duct.

5,183,436
FAN FOLDABLE MEMBERSHIP CARD MAILERS
Thomas M. Shanley, 19908 NE. 129th St., Woodinville, Wash. 98072
Filed Apr. 3, 1992, Ser. No. 863,210
Int. Cl.[5] B42D 15/00
U.S. Cl. 462—6 8 Claims

1. Fan foldable membership card mailers as supplied by a manufacturer to an organization, thereafter to be completed, separated, and delivered to respective members of the organization, comprising:

a. a roll of polyvinyl chloride stock of a designated width and designated length, having in turn:

i. pin feed spaced holes along both edges of this roll;

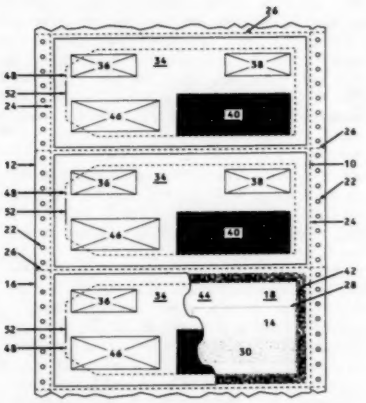
ii. perforations adjacent and parallel to the pin feed spaced holes along both edges of the initial roll;

iii. Perforations spaced transversely on this roll and extending between the perforations, which are adjacent and parallel to the pin feed spaced holes, and extending beyond them across the polyvinyl chloride stock, thereby determining the size of each membership card mailer;

iv. microperforations arranged in the direction of the length of this roll and in the transverse direction across this roll, within the perforated size of each membership card mailer, thereby determining the size of each membership card being created;

v. an N.C.R. type clear copy matte coating in a rectangular shape area at a selected location on each membership card being created; and

vi. printing on each membership card mailer of this polyvinyl chloride stock roll which: sets forth membership card usage instructions which are spaced about the area of the membership card being created; and sets forth membership card text, design, and logo on the area of the membership card being created;



b. multiple overlay of paper stock, each one of the overlays serving as a cover for each membership card mailer and adhered to the polyvinyl chloride stock about their complementary borders by an adhesive, having in turn:

i. a printed blackout area located over the N.C.R. type clear copy matte coating on each membership card being created;

ii. a printed return address of the organization;

iii. a space for necessary postage such as a printed first class bulk mailer postal permit number of the organization, which may be printed in this space;

iv. a space for the subsequent use by the organization to enter the name and address of the member of the organization; and

at this subsequent entry time, the member's name, member's membership number, and expiration date of the respective membership, will be imprinted by impact printing in the blackout area, resulting in printing on the polyvinyl material of the membership card being created, where the N.C.R. type clear copy matte coating has been previously distributed to receive this membership data, and this private data will therefore not be viewed by any persons during the sending functions, which are often mailing services, of this membership card mailer from the organization to a member thereof.

5,183,437

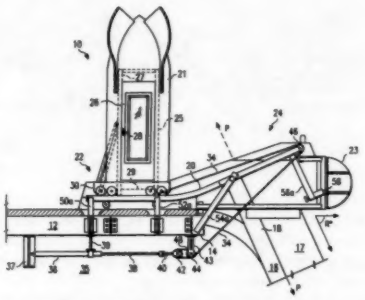
METHOD AND APPARATUS FOR INITIATING A WATER RIDE

George D. Millay, San Diego, and John D. Powell, Del Mar, both of Calif., assignors to Wet 'N Wild, Inc., Grand Prairie, Tex.

Filed May 31, 1991, Ser. No. 708,895

Int. Cl.[5] A63G *21/18*

U.S. Cl. 472—117 **19 Claims**



9. Apparatus for initiating a thrill-seeking ride from a raised access platform, the ride having a slide descending at a predetermined angle with respect to the platform and wherein the slide has a support surface located along a predetermined plane, comprising:

a track supported on the platform and extending from a first position along the raised platform to a second position located above an upper end of the slide;

a housing having at least a back and a bottom for supporting a rider in an erect position;

a carriage supporting the housing and adapted for rolling movement on the track;

means for reciprocating the carriage along the track to extend the housing with the rider therein from the first position to the second position: and

means for releasing the bottom of the housing after the housing reaches the second position to drop the rider from the housing onto the slide.

5,183,438

SPORTS FLOOR

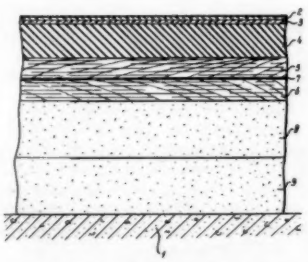
Jan Blom, Ede, Netherlands, assignor to Hollandsche Beton Groep Nov., Netherlands

Filed Apr. 17, 1991, Ser. No. 686,559

Claims priority, application Netherlands, Apr. 19, 1990, 9000933

Int. Cl.[5] E04F *15/16*

U.S. Cl. 472—92 **22 Claims**



1. Sports floor to be installed on a cohesive substructure or one composed of a sandy structure, wherein said sports floor,

viewed from top to bottom, is composed at least of the combination of the following layers or composite layers:

a) at least one relatively thin polyurethane top layer having a covering which has specific frictional properties;

b) at least one hard elastic layer formed from granules of rubber particles and air cavities present between said particles;

c) at least one relatively thin force-distributing hard layer made, for example, of plywood or hard plastic; and

d) at least one relatively thick layer made of plastic foam.

5,183,439

CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE TRANSMISSION

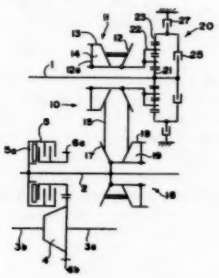
Toshiyuki Yumoto; Kouhei Ohsono, both of Fujimi; Masahiro Kanda, Higashimatsuyama, and Takahiro Matsuda, Hiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1991, Ser. No. 805,402

Claims priority, application Japan, Jan. 22, 1991, 3-021692

Int. Cl.[5] F16H *59/00*

U.S. Cl. 474—28 **15 Claims**



1. A control system for a continuously variable transmission having a hydraulic actuator for effecting at least one of speed ratio control and clutch control, comprising:

a solenoid-operated control valve for generating a controlling hydraulic pressure to be supplied to the hydraulic actuator;

hydraulic pressure generating means for generating a hydraulic pressure corresponding to the rotational speed of an engine which is associated with the continuously variable transmission;

a directional control valve for selectively connecting said solenoid-operated control valve and said hydraulic pressure generating means to said hydraulic actuator; and

a solenoid-operated on-off valve for controlling said directional control valve such that when a solenoid of said solenoid-operated on-off valve is energized, said directional control valve connects said solenoid-operated control valve means to said hydraulic actuator, and when the solenoid of said solenoid-operated on-off valve is de-energized, said directional control valve connects said hydraulic pressure generating means to said hydraulic actuator.

5,183,440

METHOD FOR CONVERTING ELLIPTICAL TO RECTANGULAR MOTION

Masahiro Ishizuka, and Kazuyuki Hayashi, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

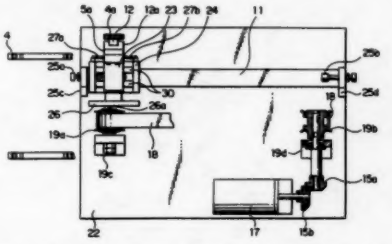
Division of Ser. No. 760,390, Sep. 16, 1991. This application Jun. 10, 1992, Ser. No. 896,446

Claims priority, application Japan, Sep. 19, 1990, 2-247232

Int. Cl.[5] F16H *7/00*

U.S. Cl. 474—101 **1 Claim**

1. A method of converting an elliptic motion of a timing belt placed over two timing pulleys into a rectangular motion, wherein a horizontal reciprocating linear motion between centers of said timing pulleys are transmitted to a portion to be driven as it was, and semi-circular motions at both ends of said reciprocating linear motions outside the distance between said



centers of said timing pulleys are converted into vertical reciprocating linear motions by employing rolling contact for absorbing the horizontal component and then transmitted to said portion to be driven so that said driven portion performs a rectangular motion.

5,183,441

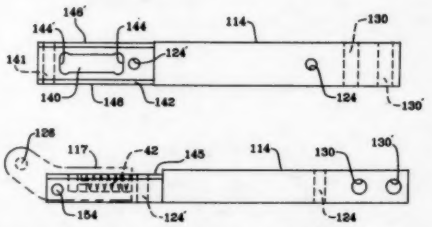
BELT SANDER TENSIONER

Urda, Paul, South Waverly, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Feb. 3, 1992, Ser. No. 829,827

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—138 **9 Claims**



1. A belt tensioning device for belt sander or the like comprising:

an elongate cantilever bar having a recessed pocket formed on its surface towards its one end;

a substantially "U" shaped saddle in axial sliding cooperation with said cantilever bar and substantially enclosing said recessed pocket;

said "U" shaped saddle being further provided with a tab projecting into said recessed pocket; and

a spring means interspersed between said tab and said recessed pocket for resiliently biasing said "U" shaped saddle in one axial direction along said cantilever bar.

5,183,442

DOUBLE HELIX, METHOD OF MAKING SAME AND SPIRAL LINK BELT MADE THEREFROM

Johannes Lefferts, Enschede, Netherlands, assignor to Siteg Siebtechnik GmbH, Ahaus-Alstatte, Fed. Rep. of Germany

Filed Dec. 9, 1991, Ser. No. 803,964

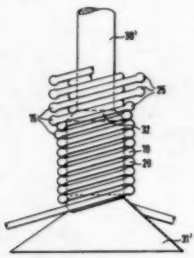
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1990, 4039399

Int. Cl.[5] F16G *1/00*

U.S. Cl. 474—239 **5 Claims**

1. A double helix comprises two partial helices having the same winding direction, said partial helices each having an oval cross-section with substantially straight upper and lower

winding legs and facing winding arcs encircling each other, wherein said upper winding legs of the partial helices extend at a different angle with respect to longitudinal axes of the partial



helices than the lower winding legs of the respective partial helices, said upper winding legs of one partial helix extend at the same angle with respect to the longitudinal axes as the lower winding legs of the other partial helix and vice versa.

5,183,443

SPEED REDUCER

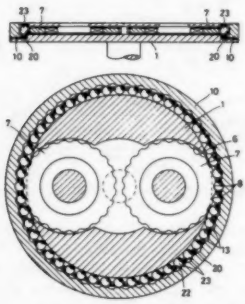
Hiroshi Murakami, 7-7-303, Hiranohigashi 4-chome, Hirano-ku, Osaka, and Tetsu Sakaida, Asahi Plaza, 65-68, Numa 1-chome, Yao-shi, Osaka, both of Japan

Filed Jan. 23, 1992, Ser. No. 824,518

Claims priority, application Japan, Sep. 20, 1991, 3-241293; Nov. 28, 1991, 3-314683

Int. Cl.[5] A01D *34/30*; F16H *13/08*

U.S. Cl. 475—168 **1 Claim**



1. A speed reducer comprising a disk-shaped input member having an outer peripheral surface, a cylindrical output member extending along the circumference of said input member and having an inner peripheral surface opposite the outer peripheral surface of said input member, a cage disposed between said input member and said output member, said cage being formed with a plurality of pockets arranged circumferentially at equal intervals between said peripheral surfaces of said input and output members, a plurality of rolling elements received in said respective pockets, said output member having a plurality of recesses in said inner peripheral surface thereof and said recesses being spaced circumferentially at equal intervals, the number of said recesses being different from the number of said rolling elements, and disks rotatably mounted in said input member and partially protruding radially from said outer peripheral surface of the input member, each said disk being provided along the outer periphery thereof with recesses arranged at intervals corresponding to the pitch of said rolling elements and engageable with said rolling elements.

5,183,444

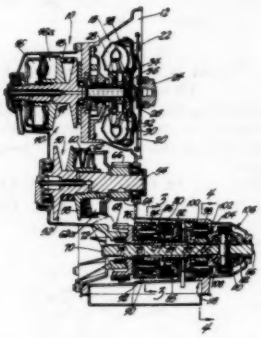
CONTINUOUSLY VARIABLE TRANSMISSION

Francis B. Robbins, Dryden, N.Y., assignor to Borg-Warner Automotive Inc., Sterling Heights, Mich.

Continuation of Ser. No. 723,249, Jun. 28, 1991, abandoned. This application Jul. 17, 1992, Ser. No. 917,513

Int. Cl.[5] F16H *37/08*

U.S. Cl. 475—210 **11 Claims**



1. A continuously variable transmission having, in combination, a first variable drive pulley, a second variable drive pulley, a v-belt trained around the first and second variable drive pulleys, a speed reduction drive, driven by the second variable drive pulley, a reversible gear drive driven by the speed reduction drive, a fixed ratio planetary reduction drive driven by the reversible gear drive in one direction or another, a differential driven by the fixed ratio planetary reduction drive and axle shafts driven by the differential.

5,183,445

ARRANGEMENT OF A DIFFERENTIAL FOR DRIVING TWO VEHICLE WHEELS

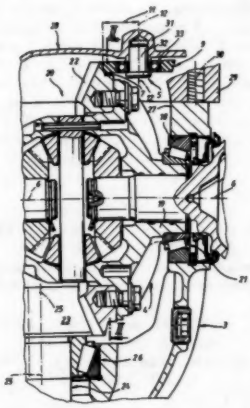
Claus-Christian Alt, Ebersbach-Weiler, Fed. Rep. of Germany, assignor to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Jan. 15, 1992, Ser. No. 820,981

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1991, 4101327

Int. Cl.[5] F16H *57/00*

U.S. Cl. 475—230 **6 Claims**



1. Arrangement of a differential for driving two vehicle

wheels, in which a gearbox casing having a bearing axis of the differential is rotably mounted in a non-rotating outer casing and a follower made of a non-metallic material and fixed in its position relative to the outer casing by a holding device can be brought into contact under a small contact pressure with an annular face of a ring gear which is fixed relative to the gearbox casing in terms of movement and is concentric to the bearing axis, wherein the follower is a solid of revolution made of a noise-deadening material rotating concomitantly with said ring gear and freely positioned to be in continuous contact with said ring gear.

5,183,446

DIFFERENTIAL MECHANISM

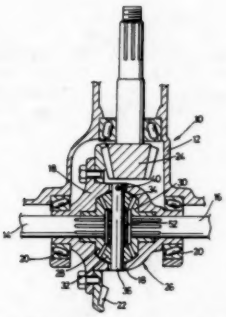
Richard E. Hughes, 49 Burstow Rd., Wimbledon, London SW20 8ST, England

Filed Feb. 26, 1992, Ser. No. 841,826

Claims priority, application United Kingdom, Mar. 6, 1991, 9104816

Int. Cl.[5] F16H *1/45*

U.S. Cl. 475—236 **15 Claims**



1. A limited slip differential mechanism including a supporting formation, a carrier journalled on or in said formation for operatively driven rotation about a first axis, a pair of driven output elements each journalled for independent rotation about said first axis, and at least one planet gear journalled in the carrier for rotation therewith and itself rotatable about a second axis normal to the first axis, said planet gear being meshed with both output elements to transmit drive thereto in common from the carrier while permitting differential motion of the output elements relative to each other; characterized in that said planet gear can shift relative to the carrier by angular displacement of the second axis relative to the carrier in a plane normal to the first axis between a neutral position at which the planet gear can rotate freely in providing said differential motion and an inhibiting position at which rotation of said gear is resisted or prevented by direct or indirect coaction between the planet gear and a braking or stop formation of or on the carrier whereby the differential motion is inhibited automatically as a function of the transmitted driving force transmitted through the carrier.

5,183,447

SEAT RECLINING MECHANISM

Tadashi Kawakita, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Aug. 26, 1991, Ser. No. 749,588

Claims priority, application Japan, Aug. 29, 1990, 2-90150[U]

Int. Cl.[5] A47C *1/025*

U.S. Cl. 475—341 **11 Claims**

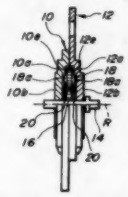
1. A seat reclining mechanism comprising:

a rotatable shaft;

a base plate which has a first through hole for receiving said rotatable shaft therein, said base plate having at a major surface thereof a first cylindrical recess which is coaxial with said rotatable shaft, said base plate having a first ring gear at a cylindrical surface defined by said first cylindrical recess;

a pivotable arm which is rotatably connected to said base plate through said rotatable shaft, said pivotable arm having a second through hole for receiving said rotatable shaft therein, said second through hole being in alignment with said first through hole, said pivotable arm having at a major surface thereof a second cylindrical recess which is merged with said first cylindrical recess so as to define a cylindrical space between said base plate and said pivotable arm, said second cylindrical recess being coaxial with said rotatable shaft, said pivotable arm having at a cylindrical surface defined by said second cylindrical recess a second ring gear which is disposed side by side with said first ring gear, said first and second ring gears having the same addendum circle but a different number of teeth;

a third cylindrical recess which is formed on one of said base plate and said pivotable arm, said third cylindrical recess



being disposed within one of said first and second cylindrical recesses and being coaxial with said rotatable shaft;

a control gear securely and coaxially mounted on said rotatable shaft, said control gear being received in said cylindrical space;

a plurality of planetary gears each of which has a toothed portion received in said cylindrical space and a first cylindrical projection formed on a rotation center thereof, said toothed portion being positioned between and meshed with said first and second ring gears and said control gear, said first cylindrical projection being received in said third cylindrical recess; and

a first supporting member for supporting said first cylindrical projections of said planetary gears, said first supporting member being coaxially and rotatably mounted on said rotatable shaft and being received in said third cylindrical recess, each of said first cylindrical projections being rotatably held by and between said first supporting member and a cylindrical smooth outer surface of said third cylindrical recess so as to suppress play of said first cylindrical projection therebetween.

5,183,448

FOOT TRAINING MACHINE

Leao Wang, Taichung Hsien, Taiwan, assignor to Greenmaster Industrial Corp., Hsien, Taiwan

Filed Jul. 26, 1991, Ser. No. 736,584

Int. Cl.[5] A63B *22/04*

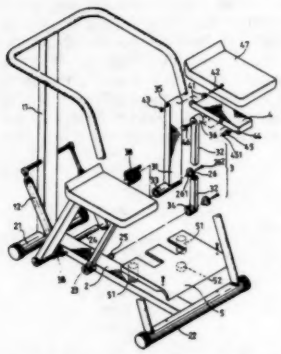
U.S. Cl. 482—52 **7 Claims**

1. A foot training machine comprising:

a base including a laterally extending front bar, a laterally extending rear bar, and a longitudinally extending connecting bar, said front and rear bars being arranged in a substantially parallel, longitudinally spaced relationship, said connecting bar being fixedly secured to and extending between said front and rear bars; and

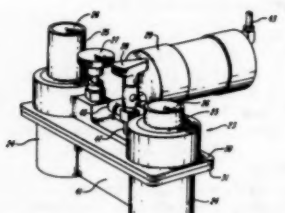
first and second pedal assemblies arranged on opposite sides of said connecting bar for movement between upper and lower operating limit positions during use of said machine, each of said pedal assemblies including: a pedal, a front rocker arm having a first end pivotally connected to said

connecting bar and a second end pivotally connected to said pedal, and a rear rocker arm having a first end pivotally connected to said connecting bar and a second end pivotally connected to said pedal, said front and rear rocker arms being substantially equal in length, the distance between the pivotal connections of the front and rear rocker arms to the connecting bar being equal to the distance between the pivotal connections of the front and rear rocker arms to said pedal, the first ends of said front and rear rocker arms being pivotally connected to said connecting bar in a common substantially horizontal plane



and the second ends of said front and rear rocker arms being pivotally connected to said pedal in a common substantially horizontal plane such that said pedal is maintained in a substantially horizontal plane throughout its range of movement, the lateral distance between the front rocker arm and said connecting bar being at least greater than the combined lateral distance between the rear rocker arm and said connecting bar and the width of the rear rocker arm such that said pedal can unobstructively move between said upper and lower operating limit positions.

5,183,449
DIE CAST SYSTEM FOR CONTROL OF STAIRCLIMBING EXERCISE DEVICE
Richard J. DeCloux, 1485 Belmont St., Manchester, N.H. 03104
Filed Oct. 3, 1990, Ser. No. 592,205
Int. Cl.[5] A63B *23/06*
U.S. Cl. 482—53 **16 Claims**



1. Apparatus for control of dual cylinder hydraulic exercise equipment, comprising:

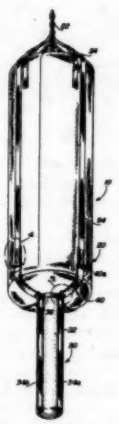
a pair of rigidly connected cylinders each having a reciprocating member therein, with each reciprocating member having a longitudinal axis, and with the top portion of each reciprocating member being exposed outside of its respective cylinder, each of said reciprocating members having means at the top thereof adapted to be contacted by a moveable member for permitting slipping or rolling motion therebetween in a direction transverse to said longitudinal axis while said moveable member is depressing the reciprocating member into its respective cylinder;

a pair of moveable members each having a contact portion adapted to be moved responsive to exercise in a direction to depress an associated reciprocating member into its cylinder;

said pair of moveable members each adapted to coact with the top portion of a respective reciprocating member at said contact portion, and each member including means for permitting a slipping or rolling motion of said contact portion relative to the exposed top portion of a respective reciprocating member in a direction transverse to the longitudinal axis thereof, whereby no substantial side forces are applied to said top portions when said moveable members act on respective reciprocating members to depress them into respective cylinders; and,

means for fluidically interconnecting said cylinders.

5,183,450
MARTIAL ARTS TRAINING APPARATUS
John J. Stelmach, 1607½ Idylwild, Prescott, Ariz. 86301
Filed Dec. 5, 1991, Ser. No. 802,507
Int. Cl.[5] A63B *69/00*
U.S. Cl. 482—83 **3 Claims**



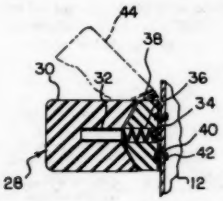
1. Apparatus for use as a training dummy in the execution of martial arts techniques comprising a generally cylindrical shaped heavy bag having opposed ends and provided with means at a first end thereof for suspending said bag from overhead, a simulated human leg one end of which is positioned immediately adjacent the second end of said heavy bag and suspended therefrom, said simulated leg being generally cylindrical in shape and of a size which substantially replicates a human leg, the exterior surface of said simulated leg being deformable and said leg being filled with a material to substantially replicate the feel of a human leg, said leg being secured to a rigid frame means for properly positioning and suspending said simulated leg from said heavy bag, said frame means being positioned at said second end of said heavy bag and external to said bag and shaped so as to conform to the shape of said second end of said heavy bag, and means for suspending and securing said frame means and said simulated leg to said heavy bag.

5,183,451

MARTIAL ARTS PRACTICE DEVICE

Jeffrey L. Hautamaki, R.R. Box 162-A, Markesan, Wis. 53946

Filed Oct. 7, 1991, Ser. No. 772,577
Int. Cl.[5] A63B *64/20*
U.S. Cl. 482—86 **1 Claim**



1. A new and improved practice striking device comprising:
upstanding support means, said upstanding support means including at least one I-beam;
base plate means for holding said upstanding support means;
striking pad means resiliently attached to said upstanding support means,
spring means to effect a resilient attachment of said striking pad means to said upstanding support means, said spring means being connected between said striking pad means and said upstanding support means, said spring means being an exclusive and only means of attachment of said striking pad means to said upstanding support means,
a truncated conically-shaped plate, said striking pad means, further comprising a concave surface to be positioned over said truncated conically-shaped plate, said truncated conically-shaped plate, in cooperation with said striking pad means, is configured to aide in facilitating a return of said striking pad means to a correct position once said striking pad means has been resiliently moved due to a user striking said striking pad means;
an abrasive cover positioned over said striking pad means, said abrasive cover serving to frictionally engage a user's appendages so as to roughen and thicken a skin surface of said
force indicating means for indicating to a user how hard of a strike was delivered by said user against said striking pad means;
removable pad means positioned over said upstanding support means, said removable pad means protecting a user against injury in the event of said user inadvertently striking said upstanding support means; and
said support means for providing greater support to said upstanding support means.

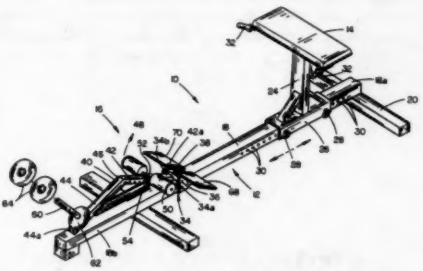
5,183,452

EXERCISE MACHINE

John L. Bacon, and Jonathan M. Bacon, both of 6141 NW Gary St., Lincoln, Nebr. 68521

Filed Oct. 18, 1991, Ser. No. 778,710
Int. Cl.[5] A63B *21/06*
U.S. Cl. 482—97 **2 Claims**

1. An exercise machine, comprising:
a base frame having forward and rearward ends;
seat means connected to the rearward end of said frame for supporting a person;
foot support means connected to said frame forwardly of the seat means for supporting the heel of a foot;
said foot support means including first and second plates mounted generally coplanar and transversely with respect to the longitudinal axis of said frame, for supporting two feet;
cushion means operable connected to said frame and extending forwardly from said foot support means and operable between a first position at rest, and a second position above and rearward of the first position, whereby toes of a foot on the foot support are located beneath the cushion means to operate the cushion means between the first and second position;
said cushion means including first and second cushions rotatably connected to said arm for pivotal movement therewith and free rotation thereon, said first cushion located to be operated by a foot on the first plate and the second cushion located to be operated by a foot on the second plate;
said cushion means including an arm having forward and rearward ends, pivotally connected at the rearward end to



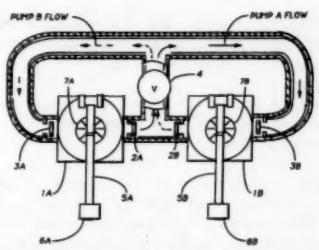
said frame for pivotal movement of said cushion means independently of said foot support means between the first and second positions;
said seat being adjustably connected to said frame for selective adjustment along the longitudinal axis of said frame, forwardly and rearwardly with respect to said foot support means; and means for connecting a plurality of weights to said arm, located such that weights connected to said arm bias said cushion means from the second position to the first position.

5,183,453

UNIDIRECTIONAL FLUID FLOW RESISTED EXERCISE DEVICE WITH INERTIAL AND ELASTIC MECHANICAL LOADING

Patsy K. Yamashiro, 9918 NE. 116th St., Kirkland, Wash. 98034

Filed Nov. 5, 1991, Ser. No. 788,129
Int. Cl.[5] A63B *21/008*
U.S. Cl. 482—112 **3 Claims**



1. Exercise apparatus comprising a pair of actuated hydraulic diaphragm pumps with flexible interconnecting members linking said diaphragm pumps to foot pedals with provision for providing resistive, inertial, and elastic exercise mechanical loads simultaneously;
each of said pumps fitted with inlet and outlet unidirectional flow valves connected to a closed hydraulic circuit with both pump outlets joined together prior to connection to a common adjustable resistance orifice comprising the resistive exercise load;
wherein fluid passage through said resistance orifice is di-

rected to the inlets of both said pumps which are connected together;

said hydraulic circuit incorporates an inertial exercise load formed by the mass of fluid moved per pump stroke as well as physical shape and dimension of the circuit conduits to provide load stability;

whereby said closed hydraulic circuit provides unidirectional flow through said adjustable resistance as both pumps are alternately activated by the exercising subject;

whereby equal activation of both said pumps leads to cessation of flow and the establishment of a means for exercise through flexion of said flexible interconnecting members which constitutes the elastic exercise load;

whereby said elastic load provides a means of simulating limb muscle contraction to maintain a standing posture while exercising in a non-standing posture.

5,183,454

PAPER CURL CORRECTION APPARATUS

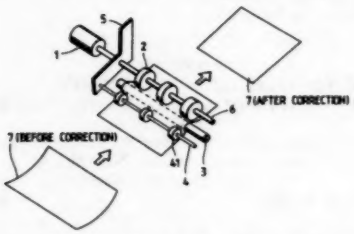
Makoto Kurosawa; Masaaki Koseki; Tetsuroh Takahashi, and Takeshi Terakado, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 609,542, Nov. 6, 1990, abandoned. This application Apr. 2, 1992, Ser. No. 863,144

Claims priority, application Japan, Nov. 10, 1989, 1-293086

Int. Cl.[5] B41F *13/54*; B65H *23/34*

U.S. Cl. 493—459 **2 Claims**



1. A paper curl correction apparatus provided along a paper conveying path in an electrostatic recording printing machine for correcting the curl in discrete paper sheets, said apparatus comprising:

a plurality of paper conveying rollers arranged on a shaft for conveying a discrete paper sheet along a path in a paper advancing direction;

a lower paper curl correction shaft;

means for biasing said paper curl correction shaft against said paper conveying rollers in a direction having a substantial component in the paper advancing direction;

a plurality of paper guide rollers arranged on a shaft and provided upstream of and spaced from said plurality of paper conveying rollers and said paper curl correction shaft with reference to the paper advancing direction, said plurality of paper guide rollers causing the paper sheet path to extend about an angular portion of the circumference of said paper curl correction shaft; and

a position varying mechanism for varying a position at which said paper guide rollers are fixed so as to vary the angular range over which said paper sheet extends about the circumference of said paper curl correction shaft and to adjust a degree of correction of paper curl.

5,183,455

APPARATUS FOR IN SITU RADIOTHERAPY

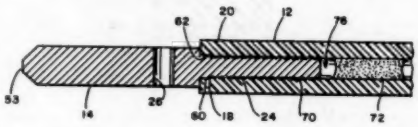
Michael H. Hayman; Lee R. Morgan, both of New Orleans, and Samuel F. Liprie, Lake Charles, all of La., assignors to Omnitron International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 255,045, Oct. 7, 1988, Pat. No. 4,976,680. This application Nov. 5, 1990, Ser. No. 609,437

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] A61M *36/04*

U.S. Cl. 600—7 **14 Claims**



1. Apparatus for in situ radiotherapy of a patient, comprising:

a flexible guide tube having a proximal end for receiving a radioisotope and a distal end for positioning the guide tube within a patient to be treated;

sealing means comprising a plug filling a portion of said guide tube for sealing the distal end of the guide tube; and

an anchor including anchor connector means for

to the flexible guide releasably connecting the anchor tube, and patient connection means for connecting the anchor permanently to the patient.

5,183,456

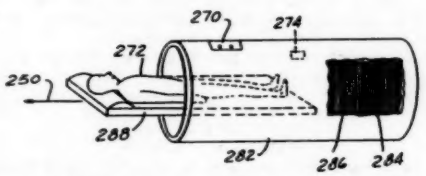
METHOD AND APPARATUS FOR THE TREATMENT OF CANCER

Abraham R. Liboff, Birmingham, Mich.; Bruce R. McLeod, Bozeman, Mont., and Stephen D. Smith, Lexington, Ky., assignors to Life Resonances, Inc., Bozeman, Mont.

Continuation of Ser. No. 703,383, May 21, 1991, which is a continuation of Ser. No. 437,485, Nov. 15, 1989, Pat. No. 5,040,050. This application Jun. 23, 1992, Ser. No. 902,929

Int. Cl.[5] A61N *2/00*

U.S. Cl. 600—9 **5 Claims**



1. A method for treating cancer comprising the steps of:

positioning a magnetic field generating means adjacent a biological subject afflicted with cancer in an existing ambient magnetic field;

generating an applied magnetic field with said magnetic field generating means, said applied magnetic field extending along an axis through said subject and combining with said ambient magnetic field along said axis to form a composite magnetic field;

measuring the magnitude of said ambient magnetic field and said applied magnetic field along said axis;

fluctuating said applied magnetic field and controlling the magnitude of said applied magnetic field along said axis to create a ratio between the frequency of said fluctuations of said applied magnetic field and the magnitude of said composite magnetic field which regulates the growth characteristics of cancer cells in said subject; and

regulating said frequency of said fluctuations based on said

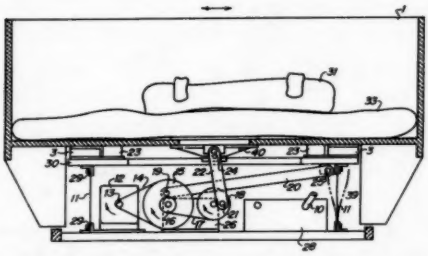
measured ambient magnetic field and the magnitude of said applied magnetic field to maintain said ratio as the magnitude of said applied magnetic field changes along said axis.

5,183,457

INFANT ENVIRONMENTAL TRANSITION SYSTEM AND METHOD

James D. Gatts; Edward M. Buckley, both of San Jose, and John W. Jamieson, Alamo, all of Calif., assignors to Infant Advantage, Inc., Milpitas, Calif.

Division of Ser. No. 415,064, Sep. 29, 1989, Pat. No. 5,037,375. This application Apr. 16, 1990, Ser. No. 509,474
Int. Cl.[5] A61G *10/00*
U.S. Cl. 600—21 **12 Claims**



1. An environmental control system comprising:

a housing, having a longitudinal axis, mounted for translational motion along said axis and for rotational motion substantially about said axis; and

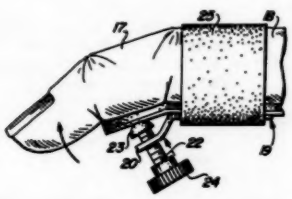
motive means coupled to said housing for imparting said translational and rotational motions thereto relative to said axis to approximate the motion experienced by a fetus while its mother is walking.

5,183,458

FINGER SUPPORT

Ralph H. Marx, 7714 N. 17th Pl., Phoenix, Ariz. 85020

Filed Jan. 29, 1992, Ser. No. 827,420
Int. Cl.[5] A61F *5/04*
U.S. Cl. 602—22 **3 Claims**



1. A finger support of the type used to overcome deformities comprising:

an elongated rectangular pliable base for supporting a finger having a contracture,

one end of said base being bent laterally of its longitudinal axis for receiving the joint of the finger having a contracture,

a rigid support mounted to the underside of said base to extend parallel therewith and having one end thereof angularly displaced from said one end of said base,

a threaded aperture extending through said one end of said rigid support,

an adjustable screw threadedly received in said aperture for extending therethrough and engaging with said one end of said base for applying a vernierly adjustable force through said base to said joint of said finger, and

an adjustable non-stretching band mounted around said joint of the finger to be straightened and said support for applying a fixed perpendicular force to said finger at the area effected by the contracture,

said adjustable screw engaging said one end of said base at a point spaced from the application of said fixed force of said non-stretching band to said contracture.

5,183,459

EMULSION PRESSURE-SENSITIVE ADHESIVE POLYMERS IN BANDAGE AND MEDICAL TAPE CONSTRUCTIONS

Margaret M. Bernard, La Verne, Calif., assignor to Avery Dennison Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 567,141, Aug. 14, 1990, which is a continuation-in-part of Ser. No. 393,970, Aug. 14, 1989, abandoned. This application Mar. 5, 1992, Ser. No. 847,957
Int. Cl.[5] A61F *13/00*
U.S. Cl. 602—52 **20 Claims**

1. A combination for use as a medical tape or bandage construction, said combination comprising:

(a) a sterilizable backing;

(b) a sterilizable inherently tacky, pressure-sensitive adhesive polymer applied to one side of said backing, said adhesive formed by emulsion polymerization and comprising on a polymerized basis and based on the total weight of the monomers:

(i) at least one alkyl acrylate containing from about 4 to about 8 carbon atoms in the alkyl group, the total amount of alkyl acrylate present being from about 35 to about 60 percent by weight;

(ii) at least one vinyl ester containing from 2 to about 16 carbon atoms in the alkyl group of the acid, the total amount of the vinyl ester present being from 15 to about 35 percent by weight;

(iii) at least one diester of a dicarboxylic acid in which each alkyl group of the diester independently contains from about 6 to about 12 carbon atoms, the total of the diesters present being in amount from about 20 to about 40 percent by weight; and

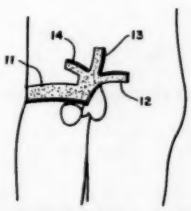
(iv) at least one unsaturated carboxylic acid containing from about 3 to about 5 carbon atoms, present in the total of the unsaturated carboxylic acid in an amount up to about 5 percent by weight, said polymer being formed in the presence of a reactive surfactant which is a vinyl functional monomer, and having a gel content of from about 50 to 70 percent by weight of the polymer prior to sterilization.

5,183,460

WOUND DRESSING RETENTION APPARATUS

Hal C. Scherz, 4026 Caminito Terviso, San Diego, Calif. 92122

Filed May 1, 1992, Ser. No. 877,237
Int. Cl.[5] A61F *13/00*
U.S. Cl. 602—79 **10 Claims**



1. A bandage for retaining a dressing on a human penis which comprises:

a substantially "L"-shaped flexible cover member having an adhesive undersurface, said cover member comprising one elongated leg member defining the longer dimension of the "L" and three adjacent short leg members extending perpendicularly from a first end of said elongated leg member such that said three short leg members together define the shorter dimension of the "L".

10. A method of securing a dressing on the penis of a human patient, wherein the dressing comprises a substantially "L"-shaped flexible cover member having an adhesive undersurface, and wherein the cover member comprises one elongated leg member defining the longer dimension of the "L" and three adjacent short leg members extending perpendicularly from a first end of the elongated leg member such that the three short leg members together define the shorter dimension of the "L", which comprises;

(a) positioning the dressing on the shaft of the human penis;

(b) positioning said cover member adjacent the base of the penis (i) such that said elongated leg member extends in a first direction which is substantially perpendicular to the shaft of the penis, (ii) such that the ends of said short leg members which extend away from said first end of said elongated leg member point away from the head of the penis, and (iii) such that said adhesive undersurface faces the penis;

(c) flexing a first short leg member, which is closest to said first end of said elongated leg member, in a second direction generally opposite to said first direction, and pressing said first short leg into adhesive contact with a first side of the base of the penis and with the patient's skin adjacent the base of the penis in said second direction;

(d) flexing a second short leg member, which is adjacent said first short leg member, and pressing said second short leg member into adhesive contact with the base of the penis and with the skin of the patient between the base of the penis and the area between the penis and navel;

(e) flexing the remaining short leg member generally in said first direction and pressing said remaining short leg member into adhesive contact with the side of the base of the penis facing said first direction and with the patient's skin adjacent the base of the penis in said first direction; and

(f) wrapping said elongated leg member circumferentially around the penis and the dressing positioned on the penis to adhesively secure the dressing in place.

5,183,461

METHOD FOR CLEANING PIERCED EARLOBES

Donna M. Hobbs, 14933 Golden Sunset Ct., Poway, Calif. 92064

Filed May 17, 1991, Ser. No. 701,830

Int. Cl.[5] A61F *11/00*

U.S. Cl. 604—49 **5 Claims**

1. A method for cleaning a pierced ear hole which comprises:

selecting a single length of flexible strand having two ends;

folding said flexible strand back on itself to form a loop portion;

bonding said two ends together to form an integral stem having a rounded tip and a stiffness greater than that of said flexible strand;

inserting said stem into and through said pierced ear hole;

grasping said stem at its tip as it exits said pierced ear hole; and

pulling said stem so that said loop compresses and passes through said pierced ear hole to clean said pierced ear hole.

5,183,462

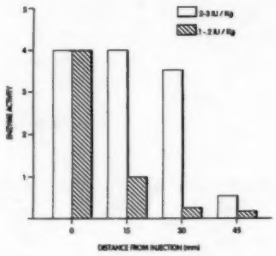
CONTROLLED ADMINISTRATION OF CHEMODENERVATING PHARMACEUTICALS

Gary E. Borodic, Canton, Mass., assignor to Associated Synapse Biologics, Boston, Mass.

Filed Aug. 21, 1990, Ser. No. 570,395

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—51 **15 Claims**



1. A method of standardizing dosages of a chemodenervating preparation by relating extent of denervation in a muscle or muscle group of an experimental animal to a unit quantity of said preparation comprising the steps of injecting a unit quantity of said preparation into said muscle or muscle group of an experimental animal, permitting said preparation to diffuse within said muscle or muscle group about the site of said injection and to physiologically inhibit acetylcholine release, and determining the spatial extent of inhibition of acetylcholine release about the site of injection within said muscle or group per said unit quantity of said preparation, thereby providing a reliable indicator to a clinician of a volume of said muscle or muscle group which is denervated by a quantity of said preparation.

5,183,463

APPARATUS FOR LOCATING A BREAST MASS

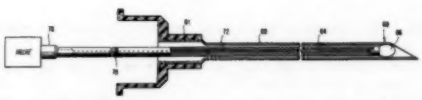
Elie Debbas, 800 Southern Ave., SE., Suite 407, Washington, D.C. 20032

Continuation-in-part of Ser. No. 305,965, Feb. 3, 1989, Pat. No. 4,966,583. This application Oct. 29, 1990, Ser. No. 604,092

The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.

Int. Cl.[5] A61M *29/02*

U.S. Cl. 604—98 **19 Claims**



16. An apparatus for localizing and palpating a mass in body tissue, said apparatus comprising:

a hollow needle having proximal and distal ends, said distal end forming a sharp tip;

a flexible catheter having a proximal end and a distal end, said proximal end being open and said distal end being closed by an expandable balloon portion positioned at a distalmost portion of said distal end of said catheter to identify the location of a mass by positioning said catheter

adjacent to the mass in the body tissue, said balloon portion being inflatable to have a diameter of about 2 to 5 cm at a mass located deeply in the body tissue so as to be palpable through the body tissue upon expansion so that a direct incision may be made from the skin to the inflatable balloon for surgically locating the mass with a minimal length incision, said catheter being insertable through said needle so that said balloon portion is provided just within the tip of said needle, said catheter having means for indicating that said balloon portion is positioned just within the tip of said needle;

valve means for selectively maintaining a pressurized fluid within said catheter, said valve means being releasably connectable to said proximal end of said catheter.

5,183,464

RADIALLY EXPANDABLE DILATOR

William R. Dubrul, Redwood City, and Cecily M. Hillsman, San Jose, both of Calif., assignors to Interventional Thermodynamics, Inc., Mountain View, Calif.

Filed May 17, 1991, Ser. No. 702,642
Int. Cl.[5] A61M *29/00*; A61B *1/32*
U.S. Cl. 128—3 **58 Claims**

1. An apparatus for forming and enlarging a penetration, said apparatus comprising:

an elongate dilation tube having a proximal end, a distal end, and an axial lumen, said tube being radially expandable from a small diameter to a larger diameter; and

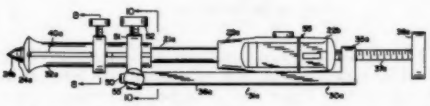
an elongate expansion member which is insertable through the axial lumen of the dilation tube from its proximal end to effect radial expansion of the dilation tube, said expansion member comprising an outer tube and an inner rod member, whereby the rod can be removed from the tube after expansion of the dilation tube to leave an access lumen through the inner tube.

5,183,465

APPARATUS FOR SUPPORTING AND MOVING NEEDLES AND TROCARS FOR PENETRATING THE ABDOMEN

Dimitrios Xanthakos, 6811 Hickory Hill Ct., Maumee, Ohio 43537, and Gus Sevastakis, 5645 Angola Road, Toledo, Ohio 43615

Filed Dec. 28, 1990, Ser. No. 636,063
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—108 **6 Claims**



1. Apparatus for manipulating a Verres needle or trocar for use in laparoscopy comprising:

a body having an open portion for receiving and supporting a Verres needle or trocar, an enlarged portion at a distal end of said open portion, and an axial passage through said enlarged portion for axial movement of the Verres needle or trocar supported on said open portion,

means at a proximal end of said body remote from said distal end for engaging the Verres needle or trocar supported on said open portion of said body and progressively advancing such Verres needle or trocar through said passage, and

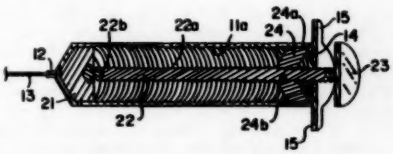
a plurality of resilient spring fingers disposed in a circumferential array on said enlarged portion of said body surrounding and parallel to said passage, flared means on said enlarged portion surrounding said passage at said distal end for engagement with said spring fingers, and means for moving said spring fingers axially along said enlarged portion simultaneously with each other against said flared means and independently of said engaging and advancing means so as to cam free ends of said spring fingers radially outwardly of said enlarged portion against resilient spring force of said spring fingers.

5,183,466

RESTRICTED USE HYPODERMIC SYRINGE

John B. Movern, 3622 Norton Place, NW., Washington, D.C.

Division of Ser. No. 400,060, Aug. 29, 1989, Pat. No. 5,021,047.
This application Jun. 3, 1991, Ser. No. 708,978
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 **16 Claims**



1. A restricted use hypodermic syringe comprising:

a tubular barrel having a forward end, a rearward end and an inner wall surface defining an interior space for accommodating a liquid to be administered and a movable plunger assembly, said barrel having means at said forward end thereof for coupling to a hypodermic needle;

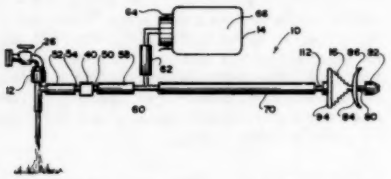
a movable plunger assembly received within said barrel, said plunger assembly having (1) a piston with an exterior surface sealingly engaging said inner wall surface of said barrel, (2) a plunger rod having a forward end joined to said piston and a rearward end extending through said rearward end of said barrel and (3) a plunger lock disposed between and engaging said plunger rod and said inner wall surface;

said plunger rod and said plunger lock having interengaging surfaces forming a one-way clutch which permits movement of said piston and plunger rod relative to said plunger lock in a rearward direction and couples said piston and plunger rod and said plunger lock for movement together in a forward direction;

said plunger lock having surfaces engaging the inner wall of said barrel to form a one-way brake which permits movement of said plunger lock in said barrel in a forward direction and prevents movement of the plunger lock in a rearward direction;

whereby (1) the piston and plunger rod can be moved rearwardly in said barrel from a first position to a second position for drawing liquid into said barrel, (2) subsequently said piston and plunger rod and said plunger lock can be moved together in said barrel forwardly from said second position to a third position to expel liquid from said interior space and establish a blocking position of said plunger lock and (3) thereafter the extent of rearward movement of said piston and plunger rod in said barrel is limited by the blocking position of said plunger lock.

5,183,467
NASAL ASPIRATOR
Daniel F. Mouney, 1616 Lakeshore Dr., New Orleans, La. 70122
Filed May 1, 1990, Ser. No. 517,577
Int. Cl.[5] A61M *37/00, 1/00;* **A62B** *00/00*
U.S. Cl. 604—149 **8 Claims**



1. A method for removing secretions from a nasal passageway, the method comprising the following steps:

providing a vacuum creation means having an inlet side and an outlet side, said vacuum creation means comprising an elongated housing having an upper internally threaded collar for engagement with a liquid flow source, and elongated housing with a central internal opening, a flow control means mounted in said central opening and a side arm integrally connected to said housing and extending outwardly therefrom, said side arm being formed with an internal passageway in fluid communication with the central opening;

providing a nasal valve means connected in fluid communication to said vacuum creation means, said nasal valve means comprising an elongated tube having a first end and a second end, a nasal seal means carried by the first end of the tube, a handle means attached to the tube a distance from said nasal seal means and a normally closed nasal valve means mounted within said housing and movable between a first, closed position substantially sealing communication between said second end of the tube and exterior of the nasal valve means and a second, opened position allowing fluid communication between the exterior of the nasal valve means and the second end of the tube;

providing a vacuum container means mounted between said vacuum creation means and said nasal valve means;

connecting an inlet side of said vacuum creation means to a liquid flow source;

positioning the nasal seal means within the nasal passageway of the user, such that the nasal seal means seals the nasal passageway;

initiating a flow of liquid through said vacuum creation means, withdrawing air from said vacuum container means to create at least a partial vacuum within said vacuum creation means;

opening said nasal valve means and creating an impulse shock for withdrawing secretions from the nasal passageway and directing them from the nasal valve means to the outlet side of the vacuum creation means; and

continuing a flow of liquid through said vacuum creation means until such time as the nasal passageway is substantially secretion-free.

5,183,468
SNAP RING NEEDLE GUARD
Donald J. McLees, 2623 Virginia Ave., Everett, Wash. 98201
Filed Apr. 2, 1991, Ser. No. 679,561
Int. Cl.[5] A61M *5/178*
U.S. Cl. 604—164 **7 Claims**

4. An intravenous catheter insertion kit and a needle tip guard comprising:

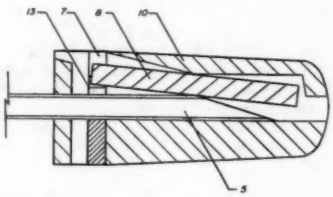
a flexible catheter and its attached standard sized catheter hub;

an insertion needle assembly, the insertion needle being initially located inside said catheter hub and said catheter, said needle also being attached proximally to a standard sized needle hub and having a distal pointed tip and a cylindrical surface;

a hollow needle tip guard enclosed entirely within said catheter hub and through which said needle passes;

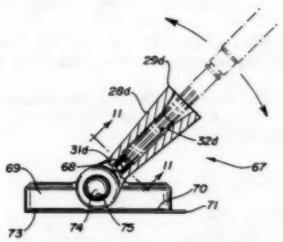
an expandable retaining ring captured within said hollow housing and through which said needle passes, said retaining ring having a gap which increases in width with distance from the axis of said ring and said ring having gripping means capable of gripping said needle when said ring is in its contracted state; and

a lever captured within said hollow housing and residing outside of said needle on the same side of said needle as said retaining ring gap, the proximal end of said lever



spreading apart said retaining ring gap and said gap exerting a force on said lever proximal end directed away from the needle axis, said lever being in pivotal contact with a point of said housing, and the distal end of said lever being in contact with said cylindrical surface of said needle whereby passage of said needle tip beyond the contact point between said needle surface and said distal lever end in the proximal direction allows said retaining ring gap force to pivot said lever about its contact point with said housing and eject said lever proximal end out of said retaining ring gap, said retaining ring thereby becoming contracted and closing said retaining ring gripping means upon said needle surface.

5,183,469
DEVICE FOR THE REMOVAL AND REPLACEMENT OF A NEEDLE SHIELD
Paul R. Capaccio, Clifton, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed May 10, 1991, Ser. No. 698,512
Int. Cl.[5] A61M *5/32;* **B65D** *83/10*
U.S. Cl. 604—192 **17 Claims**



1. A device for the removal and replacement of a needle shield having a distal end, an open proximal end and a side wall therebetween having an outside surface comprising:

a housing having a proximal end and a distal end, said housing having a bore therein beginning at said proximal end;

thread means in said housing along said bore and accessible through said bore, said thread means for engaging and holding the outside surface of the needle shield which is placed into said bore through said proximal end of said housing and rotated in a direction to advance the needle shield distally along said thread means, wherein at least

the portion of said thread means for engaging the needle shield is made of metal; and

stabilizing means at said distal end of said housing for positioning and holding said housing for allowing a person to remove and replace a needle shield without touching said device.

5,183,470

LAPAROSCOPIC CHOLANGIOGRAM CATHETER AND METHOD OF USING SAME

Peter H. Wettermann, Pomfret, Conn., assignor to International Medical, Inc., Danielson, Conn.

Filed Mar. 4, 1991, Ser. No. 664,373

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—281 **7 Claims**

1. A cholangiogram catheter comprising:

(a) a rigid tubular outer sheath having a distal end and a proximal end;

(b) a first luer connector attached to the proximal end of said sheath;

(c) an outer tubular catheter slidably seated within said outer sheath and having a proximal end and a distal portion;

(d) a second luer connector attached to the proximal end of said outer catheter, said second connector having means engageable with the first connector to releasably fix said outer tubular catheter in relation to said sheath, said distal end portion protruding form the distal end of said outer sheath as a permanently preformed arcuate resilient curve when said second connector engaged with said first connector;

(e) a flexible inner tubular catheter readily slidable within said outer catheter and longitudinally dimensioned to extend outwardly of both ends of said outer catheter, the distal end of said inner catheter having a closed tip and a discharge aperture; and

(f) a third luer connector attached to the proximal end of said inner catheter for connecting said inner catheter to an injection device.

5,183,471

LAPAROSCOPIC CANNULA

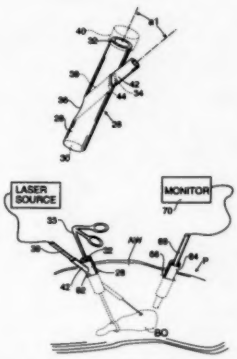
Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023

Filed Jan. 24, 1992, Ser. No. 825,158

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—284 **4 Claims**

1. A cannula for use in laparoscopy, comprising a tubular member having a first opening at a distal end and second opening at a proximal end for enabling the longitudinal insertion through said tubular member of a first laparoscopic instrument, a first aperture being disposed on a side of said tubular member distally of said second opening, a second aperture being disposed on a substantially opposite side of said tubular



member proximally of said first opening and distally of said first aperture, said first aperture and said second aperture defining a linear path for a second laparoscopic instrument, said linear path being oriented at an acute angle with respect to said tubular member.

5,183,472

ARRANGEMENT FOR TRANSCUTANEOUS FILLING OR REPLENISHMENT OF LIQUID MEDICATIONS IN AN IMPLANTABLE MEDICATION DOSING DEVICE

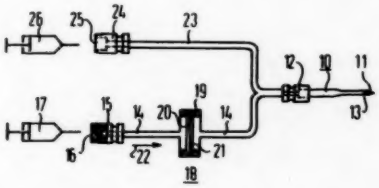
Peter Jaehrling, Puschendorf, and Eugen Schweikert, Bubenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 18, 1990, Ser. No. 629,620

Claims priority, application European Pat. Off., Dec. 21, 1989, 89123701.8

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—284 **5 Claims**



1. An apparatus for filling a reservoir for use with a source of negative pressure, said apparatus comprising:

a cannula having a paracentesis end shaped for hermetic introduction into a reservoir to be filled with fluid, and having an opposite end;

first and second flexible conduits in fluid communication with said opposite end of said cannula, each flexible conduit terminating in a free end;

first and second pierceable septa respectively attached to said free ends of said first and second flexible conduits; and

said second septum forming means for communicating said second flexible conduit and said cannula with said source of negative pressure for creating a negative pressure at said cannula for drawing fluid supplied through said first septa and said first flexible conduit into said cannula.

5,183,473

ENZYME ACTIVATED PEROXYDISULFATE BLEACH COMPOSITION

Marvin M. Crutchfield, and Bertie J. Reuben, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 26, 1991, Ser. No. 692,098
Int. Cl.[5] C11D *3/395, 7/54;* D06L *3/00, 3/02*
U.S. Cl. 8—110 **27 Claims**

1. A bleach composition comprising a sulfatase enzyme and a stable, water soluble peroxydisulfate ion forming compound which, in the presence of the enzyme, hydrolyses in aqueous solution to provide peroxymonosulfate ions.

15. A process of bleaching articles which comprises contacting the article with a bleach effective amount of an aqueous composition comprising a sulfatase enzyme and a stable, water soluble peroxydisulfate ion producing compound which, in the presence of the enzyme, hydrolyses in aqueous solution to form peroxy-monosulfate ions.

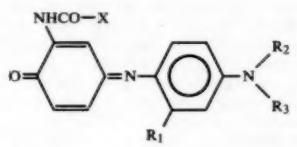
5,183,474

HEAT-SENSITIVE SUBLIMATION TRANSFER CYAN DYE AND TRANSFER SHEET

Tsukasa Ohyama, Omuta; Yasushi Shimokawa, Miike; Isamu Ghoda, Kobe; Keisuke Takuma, Omuta, and Hitoshi Koshida, Nishinomiya, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

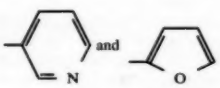
PCT No. PCT/JP90/01166, § 371 Date May 13, 1991, § 102(e) Date May 13, 1991, PCT Pub. No. WO91/04301, PCT Pub. Date Apr. 4, 1991
PCT Filed Sep. 12, 1990, Ser. No. 700,153
Claims priority, application Japan, Sep. 13, 1989, 1-235559; Dec. 12, 1989, 1-320608
Int. Cl.[5] B41M *5/38;* C09B *53/02*
U.S. Cl. 8—471 **16 Claims**

1. A heat-sensitive sublimation transfer cyan dye represented by the following formula (I):



(I)

wherein R_1 represents a hydrogen atom, an alkyl group, an alkoxyl group, an alkylcarbonylamino group, a formylamino group or a halogen atom, R_2 and R_3 represent an alkyl group, an alkenyl group, an alkoxyalkyl group, an aralkyl group, an aryl group, a halogenoalkyl group or a cyanoalkyl group or are coupled together to form a ring, and X represents any one of the following groups:



5,183,475

FUEL COMPOSITIONS CONTAINING REACTION PRODUCTS OF AROMATIC TRIAZOLES AND FATTY ACIDS SALT AS ANTIWEAR ADDITIVES

Angeline B. Cardis, Florence, N.J., and Carl E. Shanholtz, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 9, 1989, Ser. No. 434,944
Int. Cl.[5] C10L *1/22*
U.S. Cl. 44—343 **15 Claims**

1. A liquid fuel composition comprising a major proportion of a fuel selected from the group comprising alcohol and ether oxygenate fuels, diesel fuel and liquid hydrocarbon fuel and a fatty acid salt reaction product made by reacting an aromatic triazole and a fatty acid selected from the group comprising oleic acid, stearic acid, tall oil acid, and dimer acid having 10 to 40 carbon atoms, in an antiwear additive amount ranging from 0.01 to 5.0 wt. % by weight of the composition.

5,183,476

ETHANOL FUEL AND ITS USE AS A DIESEL FUEL

Göran Carlsson, Nykvarn, and Martin Hellsten, Ödsmål, both of Sweden, assignors to Berol Nobel Stenungsund AB, Stenungsund, Sweden

PCT No. PCT/SE89/00055, § 371 Date Aug. 22, 1990, § 102(e) Date Aug. 22, 1990, PCT Pub. No. WO89/07637, PCT Pub. Date Aug. 24, 1989
PCT Filed Feb. 10, 1989, Ser. No. 571,591
Claims priority, application Sweden, Feb. 22, 1988, 8800597
Int. Cl.[5] C10L *1/02*
U.S. Cl. 44—445 **17 Claims**

1. A fuel which is ethanol-based and which has the form of a solution, the fuel comprising:

from 62–94% by weight of ethanol;

from 2–8% by weight of water; and

from 2–30% by weight of an ignition improving agent consisting essentially of a water-soluble polyalkylene glycol compound containing 6–50 alkyleneoxy units with 2–4 carbon atoms and having a molecular weight of less than 2500, wherein the water-soluble polyalkylene glycol compound has a general formula

$$R\,O(A)_nH,$$

in which R is a hydrogen or a hydrocarbon group having 1–30 atoms, A is an alkyleneoxy group having 2–3 carbon atoms and at least 20% of all alkyleneoxy groups being ethyleneoxy groups, and n is an integer selected so that the polyalkylene glycol compound has a molecular weight ranging from 400 to 1000.

5,183,477

FOLIAR SPRAY AGENT FOR PROTECTING AGRICULTURAL AND HORTICULTURAL PLANTS AGAINST DISEASE INJURY

Toshio Masuda, 37-12, Bessho-machi, Ohmiya-shi, Saitama-ken, Japan

Filed Oct. 24, 1990, Ser. No. 102,011
Claims priority, application Japan, Oct. 26, 1989, 1-277124
Int. Cl.[5] A01C *1/00*
U.S. Cl. 47—58 **3 Claims**

1. A method for protecting a plant against disease injury induced by a plant pathogen which comprises spraying the foliar surface of the plant with an aqueous solution consisting essentially of from about 0.006 mg/ml to about 0.025 mg/ml of an alkali metal silicate as the effective ingredient.

5,183,478

PROCESS FOR DEWATERING QUENCHED SLAG

Douglas K. Holland, Rialto, Calif., and Edward W. Dillingham, McFarland, Kans., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 15, 1991, Ser. No. 655,612
Int. Cl.[5] C10J *3/08*
U.S. Cl. 48—197 R **9 Claims**

1. A process for continuous removal of quenched slag from a fuel gasification process employing at least one gasifier with discharge means for dumping said slag and two slag pits, comprising steps of:

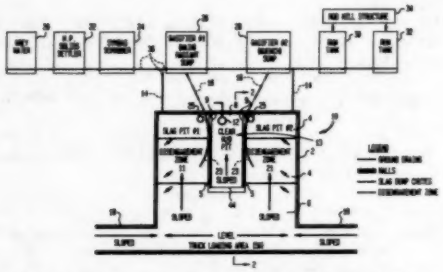
(a) periodically discharging said slag and water from said discharge means onto the upper portion of a disengagement zone of a first slag pit having a sufficient downward slope to allow free and absorbed water to separate from said slag and flow through said disengagement zone into a

lower enclosed portion of said slag pit having a plurality of vertically-spaced water-draining means;

(b) allowing said slag to accumulate and drain for a first period of time;

(c) shifting the discharge of said slag and water from said first disengagement zone and slag pit to a second disengagement zone and slag pit for a second period of time;

(d) removing the drained slag from said first disengagement zone by loading and transport means, beginning with the driest portions thereof;



(e) draining accumulated water from said first and said second slag pits into a clear water pit via said drainage means; and

(f) allowing solids to settle in the water accumulated in said clear water pit, periodically removing the clear water and settled solids;

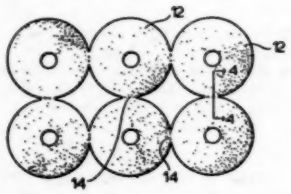
wherein said first and second slag pits are alternately used as active pits for dumping and drainage of slag, with the non-active pit being cleared as in step (d) in less time than the active pit is permitted to accumulate slag.

5,183,479

ABRASIVE DISKS AND METHOD OF MAKING

John R. Grimes, Etobicoke, Canada, assignor to Gemtex Company Limited, Etobicoke, Canada

Filed Nov. 1, 1991, Ser. No. 785,330
Int. Cl.[5] D24D *3/00*
U.S. Cl. 51—293 **11 Claims**



1. Method of making abrasive coated product comprising the step of:

providing a first plurality of interconnected shapes, with mounting apertures, where the proportion of the periphery of each such shape having connecting material to each connected shape is less than 10%,

providing a second plurality of said connected shapes with an adhesive coat,

wherein said second plurality may be less or equal said first plurality,

then applying abrasive grit to said adhesive coat,

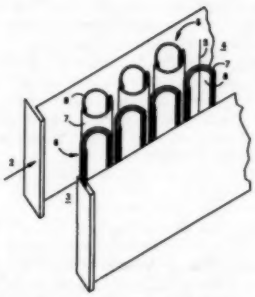
then providing a second adhesive coat over said grit carrying first adhesive coat.

5,183,480

APPARATUS AND METHOD FOR COLLECTING PARTICULATES BY ELECTROSTATIC PRECIPITATION

Michael F. Raterman, Doylestown, Pa., and Michael D. Thiel, Fairfax, Va., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 28, 1991, Ser. No. 783,472
Int. Cl.[5] B03C *3/49, 3/76*
U.S. Cl. 55—12 **20 Claims**



1. An apparatus for collecting particulates from a flowing gaseous stream containing particulates by electrostatic precipitation which comprises:

i) a gas inlet;

ii) a gas outlet;

iii) a discharge electrode for electrically charging said particulates;

iv) a particulate collecting means which comprises outer and inner concentric, nestable, semi-tubes, each of which is rotatable relative to the other from an open, nested configuration, to a substantially enclosed tube configuration having a lower end which communicates with a particulate collection receptacle, said inner semi-tube having a concave surface acting as a collecting electrode which is oppositely charged from said discharge electrode, to attract and hold said charged particulates;

v) a means for removing said particulates from said collecting electrode by subjecting said concave surface to conditions which detach said particulates therefrom;

vi) a means for forcing said gaseous stream from said gas inlet past said discharge electrode and said collecting means to said gas outlet; and

vii) a voltage source means to apply a voltage to said discharge and collecting electrodes.

13. A method for reducing catalyst particulate contamination in a flowing gas stream containing particulates wherein said gas is passed through an electrostatic precipitator which method comprises:

i) passing said gas by a discharge electrode thereby electrically charging said particulates;

ii) capturing said charged particulates on a particulate collecting means, proximal to said discharge electrode, which comprises outer and inner concentric, nestable, relatively rotatable, semi-tubes, arrayed in an open, nested configuration, said inner semi-tube having a concave surface exposed to the flow of said gas, acting as a collecting electrode which is oppositely charged from said discharge electrode until a desired amount of particulates have been collected;

iii) rotating said semi-tubes to a substantially enclosed tube configuration having an interior which is not substantially exposed to the flow of said gas, said configuration having a lower end which communicates with a particulate collection receptacle;

iv) subjecting said collecting electrode to forces which detach said particulates from said collecting electrode, said particulates dropping into a particulate collection receptacle from which they can be removed; and

v) rotating said semi-tubes from said enclosed tube configuration to said open, nested configuration; and

vi) withdrawing a gas stream of reduced particulate contamination.

5,183,481

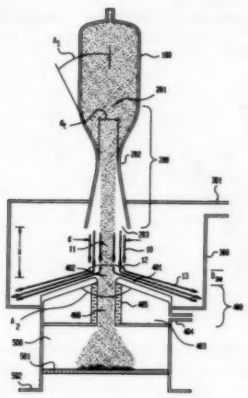
SUPERSONIC VIRTUAL IMPACTOR

William Felder, Lawrenceville, N.J., assignor to Aerochem Research Laboratories, Inc., Monmouth Junction, N.J.

Filed Jun. 7, 1991, Ser. No. 712,360

Int. Cl.[5] B01D *45/00*

U.S. Cl. 55—15 **15 Claims**



1. A method for separating particles from a gas containing said particles, comprising the steps of:

accelerating said gas containing said particles to a supersonic flow velocity in a supersonic nozzle;

forming a shock wave in front of a virtual impactor by impacting said supersonic flow against said virtual impactor wherein said virtual impactor comprises a plate having an aperture therein and an interior chamber;

separating said particles from said gas behind said shock wave with said virtual impactor wherein said particles substantially follow the original direction of flow of the accelerated gas said particles passing through said aperture of said impactor and the gas separated from said particles is caused to change direction from its original direction of flow and wherein the pressure in said interior is at least as great as the pressure between said shock wave and said plate so that there is a small positive outward flow of gas from said interior chamber through said aperture;

collecting said particles in an interior chamber cavity downstream of said aperture; and

recovering the gas separated from said particles.

5,183,482

SEPARATION BY MEMBRANE TECHNIQUES

Mitri S. Najjar, Wappingers Falls, and Martin D. Hilmar, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 19, 1991, Ser. No. 717,790

Int. Cl.[5] B01D *53/22, 71/02*

U.S. Cl. 55—16 **15 Claims**

1. The method of separating a charge gas mixture containing a more permeable gas and a less permeable gas which comprises

passing a charge gas mixture containing a more permeable gas and a less permeable gas into contact with a membrane of a high purity alumina containing aluminum-oxygen repeating units and bearing alkoxide groups;

maintaining a pressure on the charge side of said membrane greater than the pressure on the permeate side of said membrane thereby yielding a permeate containing increased quantity of said more permeable gas and decreased quantity of said less permeable gas and a retentate containing decreased quantity of said more permeable gas and an increased quantity of said less permeable gas;

recovering said permeate containing increased quantity of said more permeable gas and decreased quantity of said less permeable gas; and

recovering said retentate containing decreased quantity of said more permeable gas and an increased quantity of said less permeable gas.

5,183,483

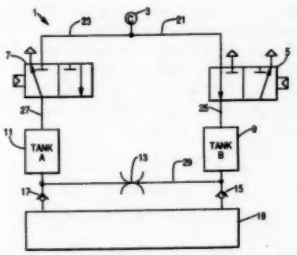
PNEUMATIC CIRCUIT CONTROL FOR PRESSURE SWING ADSORPTION SYSTEMS

John L. Servido; Robert E. Tucker, and James Murphy, all of Marietta, Ga., assignors to Healthdyne, Inc., Marietta, Ga.

Filed Aug. 21, 1991, Ser. No. 743,776

Int. Cl.[5] B01D *53/04*

U.S. Cl. 55—26 **6 Claims**



1. A method for controlling pneumatic flow in a pressure swing adsorption system including first and second molecular sieves, each having input and output sides, which selectively adsorb gas components of a feed gas, the method comprising the steps of:

a) supplying a feed gas from a compressor to said input side of one of said first and second molecular sieves via a first three-way valve connected to said input side of said one of said first and second sieves, said first sieve adsorbing selected gas molecules from said feed gas to produce a product gas;

b) supplying said product gas to said second sieve;

c) purging previously adsorbed gas molecules in said second sieve using said product gas, and exhausting said product gas and said previously adsorbed gas molecules via a second three-way valve which is connected to the inlet side of the other of said first and second molecular sieves;

d) when said first sieve reaches its molecular adsorption capacity, only supplying the input side of said second sieve with feed gas from said compressor and said first sieve to balance the pressure in said first and second molecular sieves; then

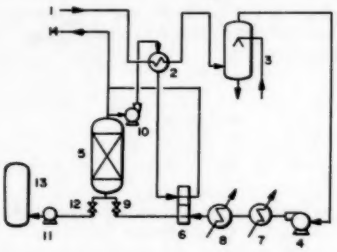
e) repeating steps a-d except that said second sieve initially receives feed gas via said second three-way valve and produces said product gas while said first sieve is purged of said adsorbed gas molecules via said first three-way valve.

5,183,484

PROCESS FOR REMOVAL OF WATER IN RAW MATERIAL MIXED GAS

Akira Yamaguchi; Masaru Uno, both of Hyogo; Norio Sekikawa, Tokyo; Fumio Arai, Tokyo, and Kenji Matsuzaki, Tokyo, all of Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyoga, Japan

Filed Oct. 28, 1991, Ser. No. 783,221
Claims priority, application Japan, Nov. 2, 1990, 2-298655
Int. Cl.[5] B01D *53/02*
U.S. Cl. 55—34 2 Claims



1. In a process for the recovery of CO_2 gas in a raw material mixed gas by a PSA method using a PSA apparatus, in which CO_2 gas is adsorbed with zeolite molecular sieves and then desorbed therefrom, the improvement comprising the steps of: cooling the raw material mixed gas with a cooler; passing the raw material gas through a rotary dehumidification apparatus to remove water in the raw material mixed gas at 0° to 15 C.; and regenerating the rotary dehumidification apparatus by using as a gas for regeneration unadsorbed gas discharged from an adsorption step in the PSA apparatus while heating the evaporate and deadsorb water from the rotary dehumidification apparatus.

5,183,485

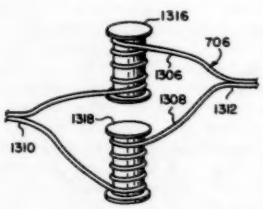
Patent Not Issued For This Number

5,183,486

APPARATUS FOR DEGASSING A LIQUID

Ronald A. Gatten, Pleasanton; Leslie A. Miller, San Jose; Thomas J. McCall, Jr., Fremont, and Vance J. Nau, Cupertino, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Dec. 4, 1990, Ser. No. 622,999
Int. Cl.[5] B01D *19/00*
U.S. Cl. 55—159 4 Claims



1. A vacuum degassing unit for degassing a liquid, comprising:

a vacuum chamber including a vacuum pump for creating a vacuum in said vacuum chamber;

a source of liquid;

a bobbin in said chamber; and

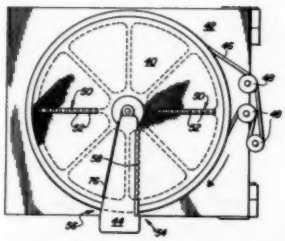
a first tube for conducting said liquid through said chamber, said first tube being wound in coils around said bobbin, the adjacent coils of said first tube being spaced from each other and said tube being permeable to gases in said liquid.

5,183,487

TRASH HANDLING APPARATUS FOR A SELF-CLEANING ROTARY SCREEN

James I. Lodico, Hampton; David R. Coder, East Moline; Lawrence J. Adams, Geneseo; Rebecca A. F. Guthrie, Coal Valley, all of Ill.; Raymond M. Andes, Jr., Bettendorf, Iowa, and Philip G. Alexander, Geneseo, Ill., assignors to Deere & Company, Moline, Ill.

Filed Apr. 24, 1992, Ser. No. 874,287
Int. Cl.[5] B01D *46/04*
U.S. Cl. 55—289 14 Claims



1. A self-cleaning filter screen for filtering out large particulate matter from an air stream, said screen comprising:

a planar screen arranged to intercept an air stream so that air to be filtered flows through the screen, the screen having an upstream side and a downstream side;

a cutter bar is mounted to the upstream side of the screen, the cutter bar is provided with a series of outwardly extending ribs;

a chamber is located on the upstream side of the screen for removing material attached to the screen, the chamber is provided with a leading edge and a trailing edge;

a comb is mounted to the leading edge of the chamber, the comb having a castellated edge with a series of notches that correspond to the outwardly extending ribs of the cutter bar; and

means for rotating the screen relative to the chamber, whereby large particulate matter located on the screen is scissored by the ribs acting in concert with the notches as the screen is rotated relative to the chamber.

5,183,488

MULTI-STAGE FILTER FRAME ASSEMBLY

Richard A. Deering, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.

Filed Apr. 30, 1992, Ser. No. 876,177
Int. Cl.[5] B01D *46/02*
U.S. Cl. 55—320 7 Claims

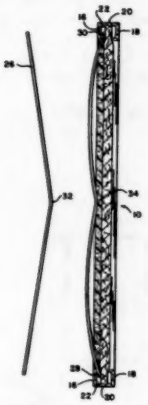
1. A multi-stage air filter assembly comprising:

a first filter layer having its outer edges disposed within a channel defined by the top, bottom and side walls of a metal frame,

at least one additional filter layer disposed in a freely overlying relationship to said first filter layer, and

a plurality of elongated retaining means extending across said additional filter layer and having a first end removably disposed within a first frame channel and a second end removably disposed within a second channel opposite said first channel, said retaining means having at least one bend disposed along its length whereby said first and

second ends are urged upwardly away from said additional filter layer and into engagement with a frame wall



and a portion of said retaining means is urged into contact with said additional filter layer.

5,183,489

METHOD OF MAKING MULTI-FERRULES HAVING A SERIES OF CHANNELS WITH PARALLEL AXES

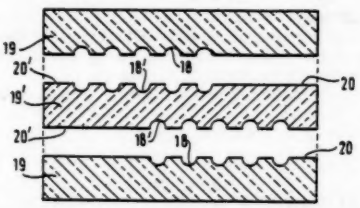
Claude Brehm, Montrouge; Philippe Dupont, Melun, and André Tardy, Egly, all of France, assignors to Alcatel Fibres Optiques, France

Filed Nov. 5, 1991, Ser. No. 787,832

Claims priority, application France, Nov. 8, 1990, 90 13857; Aug. 30, 1991, 91 10786

Int. Cl.[5] C03B *37/027, 23/20*

U.S. Cl. 65—4.2 **18 Claims**



1. A method of making multi-ferrules from a vitreous material, the multi-ferrules having a series of cylindrical channels with parallel axes, said method comprising the following steps:

forming a multi-ferrule blank of well-defined section from a solid block of vitreous material and creating within said block a plurality of spaced cylindrical passages having parallel axes and an inside diameter Di,

positioning said blank vertically in an apparatus similar to a fiber drawing apparatus for optical fibers,

exerting traction on a piece formed at the bottom end of said blank,

heating and simultaneously drawing said blank to a determined outside dimension, and

forming a multi-ferrule of selected length by cutting a given length from the piece thus obtained.

5,183,490

OPTICAL FIBER SOOT SYNTHESIS APPARATUS

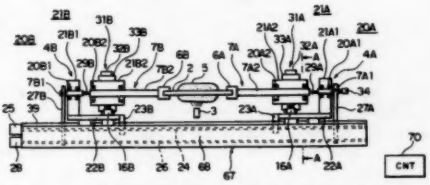
Toshihiro Mikami, Ichihara; Yukio Kohmura, Chiba; Yoshinori Ishida, and Akira Nogami, both of Ichihara, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1991, Ser. No. 761,004

Claims priority, application Japan, Oct. 25, 1990, 2-287731; May 8, 1991, 3-102645; May 15, 1991, 3-110142

Int. Cl.[5] C03B *37/025, 37/07*

U.S. Cl. 65—144 **33 Claims**



1. Apparatus for synthesizing an optical fiber preform comprising an elongated optical fiber core member having a pair of spaced end portions and an elongated central portion, and a cladding layer of soot formed on said central portion of the core member, said apparatus comprising:

a core member support and rotational drive mechanism for supporting a said core member for rotation about a horizontal axis, said rotational drive mechanism including a pair of spaced core member support and rotational drive units, said units being horizontally spaced apart and arranged so that the optical fiber core member extends horizontally between the units with one end portion of the core member supported by one of the units and with the other end portion of the core member supported by the other of the units;

a burner for synthesizing and discharging optical fiber soot material to be deposited on the central portion of the core member and an oxyhydrogen flame, said burner being disposed between said units beneath the central portion of the core member supported for rotation by said mechanism;

a housing presenting a chamber for accommodating the burner, the central portion of the core member, and the soot material generated by said burner;

a reciprocation drive assemblage for reciprocating the core member and the burner relative to one another in a horizontal direction; and

a weight measuring mechanism for measuring the weight of the core member and the soot material deposited thereon, said weight measuring mechanism including a pair of spaced weight measuring components, said components being disposed between said core member support and rotational drive units and being horizontally spaced apart so that said central portion of the core member is positioned therebetween.

5,183,491

MATERIAL FOR THE TEMPERING OF GLASS

Benoit D'Iribarne, Aachen, Fed. Rep. of Germany; Henri Mairlot, Acoz, Belgium, and Paul Houang, Sao Paulo, Brazil, assignors to Saint-Gobain Recherche, Aubervilliers, France

Continuation of Ser. No. 477,126, Feb. 7, 1990, abandoned, which is a continuation of Ser. No. 257,684, Oct. 14, 1988, abandoned. This application May 28, 1991, Ser. No. 707,947

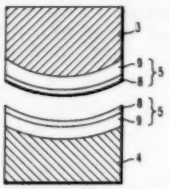
Claims priority, application France, Oct. 14, 1987, 87 14185

Int. Cl.[5] C03B *27/00*

U.S. Cl. 65—351 **15 Claims**

1. In an installation for contact-tempering glass plates, said glass plates having a thickness of 1 to 10 mm, said installation including cooling plates mounted so as to be movable toward one another for holding the glass plates positioned therebe-

tween, a layer of material supported by each of the cooling plates for direct contact with the glass plates such that the glass plates are contacted only by the material when the glass plates are held by the cooling plates, each said material comprising a



heat resistant material having a heat resistance of between about $0.25 \cdot 10^{-3}$ and $1 \cdot 10^{-2}$ $m^2 \cdot K \cdot W^{-1}$,

wherein said material comprises threads having a diameter of less than 50 microns, at least some of said threads being metallic.

5,183,492

HERBICIDAL 3-ARYLURACILS

Milos Suchy, Pfaffhausen; Paul Winternitz, Greifensee, and Martin Zeller, Baden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

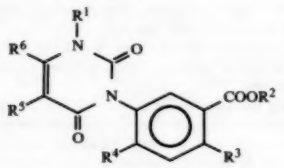
Filed Feb. 27, 1991, Ser. No. 656,133

Claims priority, application Switzerland, Jun. 29, 1989, 2450/89

Int. Cl.[5] **A01N** *43/54*; **C07D** *239/54, 239/70, 239/96*

U.S. Cl. 504—243 **15 Claims**

1. A compound of the formula



I

wherein

R^1 signifies hydrogen, C_{1-4}-alkyl, $C_{3\ or\ 4}$-alkenyl, $C_{3\ or\ 4}$-alkynyl or C_{1-4}-haloalkyl,

R^2 signifies C_{1-6}-alkylsulphonyl-C_{1-4}-alkyl, di(C_{1-6}-alkyl)-phosphono-C_{1-4}-alkyl, tri(C_{1-6}-alkyl)silyl-C_{1-4}-alkyl, C_{2-7}-alkanoyl-C_{1-4}-alkyl, carboxy-C_{1-4}-alkyl, {[C_{3-9}-(α-alkylalkylidene)]iminooxy-(C_{1-6}-alkoxy)carbonyl}-C_{1-4}-alkyl, (C_{3-6}-alkenyloxy)carbonyl-C_{1-4}-alkyl, (C_{3-6}-alkenyloxy-C_{1-4}-alkyl, C_{3-8}-cycloalkenyloxy-C_{1-4}-alkyl, C_{5-8}-cycloalkenyl, C_{6-8}-bicycloalkyl, C_{6-8}-bicycloalkenyl, C_{2-7}-cyanoalkyl or C_{3-6}-alkynyloxy-C_{1-4}-alkyl,

R^3 signifies halogen or cyano,

R^4 signifies hydrogen or halogen,

R^5 signifies hydrogen, fluorine or C_{1-4}-alkyl and

R^6 signifies C_{1-4}-alkyl or C_{1-4}-haloalkyl or

R^5 and R^6 together form trimethylene or tetramethylene, or the corresponding enol ether of a compound of formula I in which R^1 is other than hydrogen or C_{1-4}-haloalkyl or a salt of a of formula I in which R^1 signifies hydrogen.

5,183,493

METHOD FOR MANUFACTURING SPHERICAL PARTICLES OUT OF LIQUID PHASE

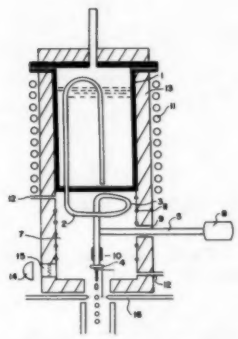
Egbert Brandau, Alzenau; Hans Huschka, Hanau; Martin Kadner, Maintal, and Waldemar Schröder, Hasselroth, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Alzenau, Fed. Rep. of Germany

Filed Jul. 8, 1991, Ser. No. 726,803

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1990, 4022648

Int. Cl.[5] **B22F** *9/00*

U.S. Cl. 75—335 **7 Claims**



1. A method for the manufacture of spherical particles having a grain size in the range 5μ to 5 mm by melting the material from which the particles are formed and solidifying it, said method comprising the steps of

a) melting said material,

b) feeding the melted material into a vibrating nozzle,

c) forming the melted into droplets by allowing them to fall through a first drop zone, the distance through which the droplets fall in said first drop zone being sufficiently high for the droplets of melted material to form into spherical droplets,

d) maintaining the temperature of said material as it falls through said first drop zone in the range 1° to 10° C. above the melting point of said material,

e) allowing the droplets to fall through a second drop zone,

f) solidifying the spherical droplets as they fall through said second drop zone by suddenly chilling them, by maintaining the temperature in said second drop zone at least 100° C. below the melting point of the material,

g) thermally separating said first drop zone and said second drop zone, and

h) collecting the solidified droplets.

5,183,494

PROCESS FOR MANUFACTURING RARE EARTH-IRON-BORON PERMANENT MAGNET ALLOY POWDERS

Ti Y. Liu, Hsinchu; Chi J. Chen, Kaohsiung, and Shou H. Chen, Hsin Chu, all of Taiwan, assignors to Industrial Technology Research Instiute, Hsinchu, Taiwan

Filed Apr. 23, 1991, Ser. No. 690,056

Int. Cl.[5] **H01F** *1/02*

U.S. Cl. 75—349 **6 Claims**

1. A process for producing rare earth-iron-boron permanent magnetic alloy powders comprising the steps of:

a) heating pellets comprising a mixture of rare earth metal oxides, iron powder, ferroboron powder and calcium granules to a temperature of from about 800 to about 1300° C. for reaction/diffusion under an inert atmosphere to obtain a rare earth-iron-boron alloy of uniform composition,

b) powdering the resulting alloy to powders of from about 10 to about 60 mesh;

c) contacting said powders with an agitated aqueous solution of acetic acid containing a non-ionic surfactant and an alkali metal acetate.

5,183,495

METHOD FOR CONTROLLING A FLOW RATE OF GAS FOR PREREDUCING ORE AND APPARATUS THEREFOR

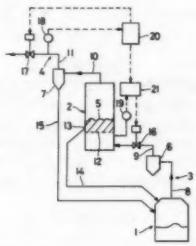
Tatsuro Ariyama; Shinichi Isozaki; Kenzo Yamada; Masahiro Matsuo, and Genji Kanatani, all of Kawasaki, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Nov. 29, 1990, Ser. No. 619,759

Claims priority, application Japan, Dec. 4, 1989, 1-313259; Feb. 2, 1990, 2-23749

Int. Cl.[5] C21B *7/24, 13/14*

U.S. Cl. 75—379 **10 Claims**



1. A method for controlling a flow rate of a gas for prereducing ore, in a system comprising a smelting reduction furnace coupled to a prereduction furnace having ore in the form of a fluidized ore bed, the method comprising the steps of:

feeding substantially all of gas generated in said smelting reduction furnace to said prereduction furnace through a first gas flow passage, said first gas flow passage coupling said smelting reduction furnace to said prereduction furnace;

prereducing ore in said prereduction furnace having said fluidized bed with said gas fed to said prereduction furnace through said first gas flow passage;

exhausting said gas used for prereducing ore from said prereduction furnace through a second gas flow passage;

smelting and reducing the prereduced ore in said smelting reduction furnace;

controlling an actual flow rate of said gas generated in said smelting reduction furnace and fed into said prereduction furnace through said first gas flow passage by controlling a pressure of said gas fed to said prereduction furnace through said first gas flow passage with a gas pressure control valve positioned in said first gas flow passage, the pressure controlled gas being fed to said prereduction furnace and the pressure of said pressure controlled gas being controlled on the basis of a pressure valve detected by a pressure detector positioned at a gas inlet port positioned inside said prereduction furnace; and

the actual flow rate of said gas being fed into said prereduction furnace being controlled so that the actual flow rate is larger than a minimum reference value of the actual flow rate required to cause the ore in the fluidized bed to be fluidized, and is smaller than a maximum reference value of the actual flow rate of said gas.

5,183,496

COPPER SPEISS AS A CO-ADDITIVE IN REFINING CRUDE LEAD BULLION

Michael H. Blenk, Youngstown, N.Y.; Russell B. Diemer, Jr., Hockessin, Del., and John P. Hager, Golden, Colo., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 13, 1992, Ser. No. 835,649

Int. Cl.[5] C22B *13/06*

U.S. Cl. 75—702 **4 Claims**

1. In a process for concentrating elemental lead in crude lead bullion which has a sulfur content of less than about 1.3% by weight and comprises introducing sodium into the molten crude lead bullion and cooling the bullion to solidify and isolate a matte phase and a copper speiss phase from a lead bullion phase, the improvement comprising adding previously isolated copper speiss to the molten bullion prior to or substantially simultaneously with the sodium whereby formation of the three distinct phases is enhanced.

5,183,497

IRON AND A COPPER SPEISS AS CO-ADDITIVES IN REFINING CRUDE LEAD BULLION

Michael H. Blenk, Youngstown, N.Y.; Russell B. Diemer, Jr., Hockessin, Del., and John P. Hager, Golden, Colo., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 13, 1992, Ser. No. 835,646

Int. Cl.[5] C22B *13/06*

U.S. Cl. 75—702 **6 Claims**

1. A process for concentrating elemental lead in molten crude lead bullion, in which the crude lead bullion contains less than about 1.3% by weight sulfur, which comprises:

(a) casting the molten bullion at a temperature in the range of from about 1100° C. to about 1200° C.;

(b) cooling the cast bullion to a temperature in the range of from about 750° C. up to a value which is less than the boiling point of sodium whereby to form a partial matte crust over the surface thereof;

(c) introducing sodium or a sodium-containing reagent into the bullion;

(d) prior to or substantially simultaneously with the sodium, introducing an amount of iron metal or an iron-containing sulfide reagent into the crude lead bullion which is in the range of from about 50% up to about 100% of the stoichiometric iron requirement based on the concentration of arsenic in the bullion;

(e) prior to or substantially simultaneously with the sodium, introducing an amount of previously isolated copper speiss into the crude lead bullion which is at least about 5% by weight of the bullion; and

(f) cooling the cast bullion to separate a matte phase and a speiss phase from the lead bullion phase.

5,183,498

GAS BARRIER FOR THE REFINING SUPERALLOY

Robert E. Haun, Ukiah; Neil C. Elmer, Potter Valley, and Robin A. Lampson, Ukiah, all of Calif., assignors to Retech, Inc., Ukiah, Calif.

Filed Nov. 21, 1991, Ser. No. 796,102

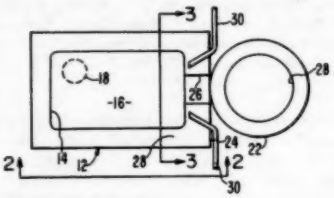
Int. Cl.[5] C21B *3/04*

U.S. Cl. 75—709 **20 Claims**

1. Metallurgical apparatus comprising:

an open top hearth having means for heating a mass of metal in the hearth to a molten condition, said hearth having a wall provided with a fluid outlet therein for allowing molten metal to flow out of the hearth; and

means adjacent to the hearth near said wall thereof for directing a gas under pressure in a direction away from



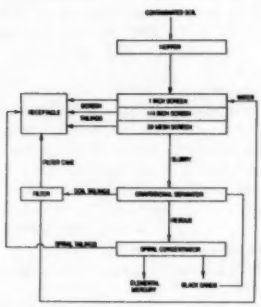
the outlet and back into the hearth to remove impruities from the surface of a molten metal in the hearth.

5,183,499

METHOD OF RECOVERING ELEMENTAL MERCURY FROM SOILS

Michael Chintis, Tempe, Ariz., assignor to Hunter Mining Company, Silver City, N. Mex.

Filed Dec. 26, 1991, Ser. No. 813,851
Int. Cl.[5] C22B *43/00*
U.S. Cl. 75—742 **30 Claims**



1. A method of removing elemental mercury from soil, comprising the steps of:

uniformly sizing the soil containing elemental mercury;

feeding the elemental mercury containing soil into at least one gravitational separator;

separating the soil and elemental mercury by gravity into soil tailings and a residue, said residue comprising elemental mercury and heavy materials;

discharging said soil tailings from said gravitational separator;

removing said residue from said gravitational separator; and

with a gravitational concentrator, recovering elemental mercury from said residue by gravitation.

5,183,500

ELECTROLESS PLATING BATH COMPOSITION AND METHOD FOR PRODUCTION THEREOF

Kazuhiro Fukuoka, Matsudo; Keiki Kiyohara, Gokamura; Tadayuki Konishi; Isao Miyatake, both of Tokyo, and Masaji Hamamoto, Osaka, all of Japan, assignors to Kosaku & Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1991, Ser. No. 754,753
Claims priority, application Japan, Apr. 18, 1991, 3-112183
Int. Cl.[5] C23C *18/54*
U.S. Cl. 106—1.22 **2 Claims**

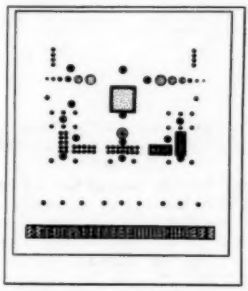
1. An electroless plating bath composition for plating a substrate provided with a resist film, said bath produced by mixing sufficient amounts of:

(a) stannous oxide,

(b) at least one member selected from the group consisting of lead oxide and lead perchlorate,

(c) perchloric acid and

(d) thiorea



such that the bath concentration of tin is from 6 to 22 g/l, the bath concentration of lead is from 8 to 30 g/l, the bath concentration of perchloric acid is from 19 to 58 g/l and the bath concentration of thiourea is from 20 to 70 g/l.

5,183,501

INK COMPOSITIONS FOR INK JET RECORDING

Hideo Kawashita; Mituhiro Ohta, and Kazuya Ogino, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited and Tnoka Chemical Co. Ltd., both of Osaka, Japan

Filed Oct. 11, 1991, Ser. No. 775,029
Claims priority, application Japan, Oct. 17, 1990, 2-279586; Mar. 13, 1991, 3-74584
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 D **7 Claims**

1. An ink composition for ink jet recording comprising a water-soluble dye, an organic solvent and water, wherein said dye is a compound represented by the formula (1):

$$D-(SO_2CH_2CH_2SO_3H)_m \quad (1)$$

wherein D represents a dye residue selected from the group consisting of monoazo and polyazo dyes, their complexes with Cr, Fe, Co and Cu, copper and nickel phthalocyanine dyes, anthraquinone dyes, dioxazine dyes, and formazane complex dyes, and m represents an integer of 1, 2, 3 or 4, or a salt thereof.

5,183,502

WATER BASED INK FOR INK-JET PRINTING

Roland Meichsnër, Buttenheim, and Werner Schmickl, Neumarkt, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 195,579, May 18, 1988, abandoned. This application Nov. 8, 1989, Ser. No. 433,294
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 K **6 Claims**

1. Water based ink for ink-jet printing, consisting essentially of:

0.5–8 wt % water soluble dye,

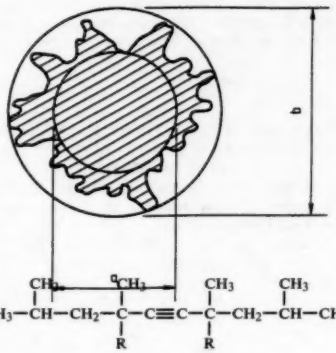
1–64 wt % glycol comprising a mixture of ethylene glycol and triethylene glycol in a ratio of 0.1 to 6.0,

0.01–5 wt % wetting agent,

0.01–2.0 wt % preservative, pH-regulator, complexing agents, other additives, or mixtures thereof,

as well as distilled water,

where the wetting agent is a formulation of the following structure



where R=OH or R=(O—CH_2—CH_2)$_n$—OH with n=1 to 30.

5,183,503

METHOD OF SHAKER MOLDING AND COMPOSITION THEREFOR

Allen A. Greenberg, 3531 N. 47th St., Hollywood, Fla. 33021

Filed May 13, 1992, Ser. No. 882,009
Int. Cl.[5] C08L *5/00*
U.S. Cl. 106—38.51 **6 Claims**

1. In a method of forming a molded object which comprises mixing together approximately 5–10 parts by weight of water and one part by weight of a molding powder mixture consisting essentially of from 7 to 15 percent by weight alkali metal alginate, a calcium salt in amount equal to about 1.2 times by wt. the amount of alkali metal alginate, and ¾ to 3 percent tetrasodium pyrophosphate, the remainder being a filler selected from the group consisting of diatomaceous earth, silica, magnesium carbonate, and kaolin, allowing the mixture to set and gel in a mold, and drying the resulting gelled object outside the mold to form a smaller rigid object, the improvement which comprises employing the alginate from *Laminaria hyperborea.*

5,183,504

AQUEOUS COATING COMPOSITION

Teruaki Kuwajima, Higashiosaka; Shinichiro Umeda, Kyoto, and Sakuichi Konishi, Ikoma, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed May 21, 1991, Ser. No. 703,805
Claims priority, application Japan, May 21, 1990, 2-130861
Int. Cl.[5] C09C *1/62;* **C08J** *00/00*
U.S. Cl. 106—404 **8 Claims**

1. An aqueous coating composition comprising:

(a) an aqueous varnish of a film-forming polymer having a number average molecular weight of 6,000 to 50,000, prepared by copolymerizing 5 to 40% by weight of a (meth)acrylamide, 3 to 15% by weight of acidic group-containing ethylenic monomers, 10 to 40% by weight of hydroxyl group-containing ethylenic monomers and the balance of ethylenic monomers other than acidic group-containing ethylenic monomers and hydroxy group-containing ethylenic monomers, and a portion of the acid groups is neutralized,

(b) an aqueous dispersion of a urethane oligomer in an aqueous medium containing either a primary or secondary polyamine or both, prepared by reacting polycarbonate diols having a molecular weight of 100 to 5,000, diisocyanate compounds and active-hydrogen containing hydrophilic compounds under isocyanate-rich conditions, followed by dispersing the reaction product in the aqueous medium;

said polymer varnish (a) being present in an amount of 95 to 10 wt % (solid) and the oligomer dispersion being present in an amount of 5 to 90 wt % (solid) in said composition.

5,183,505

CELLULAR CONCRETE

Stewart C. Spinney, Effort, Pa., assignor to Concrete Technology, Inc., Stockertown, Pa.

Filed May 27, 1992, Ser. No. 889,481
Int. Cl.[5] C04B *24/08, 28/26*
U.S. Cl. 106—672 **36 Claims**

1. A cellular concrete mix for the preparation of cellular concrete aggregate comprising:

(a) cement;

(b) water;

(c) an additive comprising a colloidal solution or sol-gel composition selected from the group consisting of suspensions of water-sodium bentonite, water-peptized calcium bentonite, water-attapulgite and a gelled silica based sol-gel;

(d) fines; and

(e) a stable small-celled foam composition comprising a foam-making agent,

the water being present in an amount to hydrate the cement and sustain the foam, the fines being present in an amount between about 10% and 70% of the combined weight of fines and cement, and the additive being present in an amount sufficient to substantially eliminate setting-shrinkage of the cellular concrete and prevent cell coalescing.

5,183,506

MODIFIED FLUX COMPOSITION FOR CEMENT

Zhong M. Zhang, Shuang Gang, Nan Chang, Jiang Xi, China

Continuation-in-part of Ser. No. 578,902, Sep. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 234,125, Aug. 19, 1988, abandoned. This application Mar. 5, 1992, Ser. No. 846,096
Claims priority, application China, Aug. 19, 1987, 87/105757
Int. Cl.[5] C04B *7/02*
U.S. Cl. 106—739 **6 Claims**

1. A composition for producing cement, comprising cement raw materials and 1–10% by weight of a flux composition, consisting essentially of by weight:

low grade wollastonite	50–99%, and
tremolite	1–50%.

5,183,507

PARTICULATE MATERIAL DISPENSING DEVICE

Welby J. Scherer, P.O. Box 3875, Champaign, Ill. 61826

Filed Oct. 25, 1990, Ser. No. 602,965
Int. Cl.[5] B05C *19/06*
U.S. Cl. 118—18 **14 Claims**

1. A dispensing device for automatically dispensing measured amounts of particulate material comprising:

supply means for supplying a quantity of particulate material;

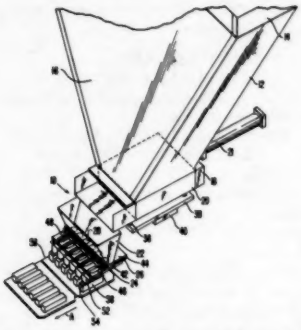
a chute for receiving said particulate material from said supply means;

automatic reciprocating pusher means in said chute for controlling the amount of said particulate material dispensed from said supply means and for discharging said dispensed particulate material from said chute;

a distribution hopper for receiving said particulate material from said chute;

a reciprocating measuring plate having a plurality of open-

ings therein for receiving said particulate material in said openings from said distribution hopper; and



a plurality of mask hoppers for receiving said particulate material from said measuring plate openings and subsequently dispensing said particulate material.

5,183,508

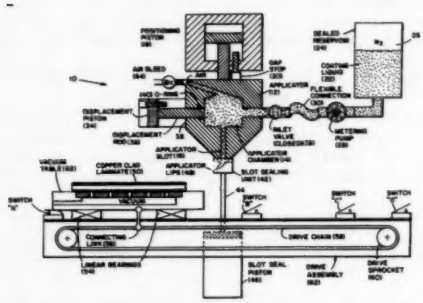
APPARATUS FOR PATCH COATING PRINTED CIRCUIT BOARDS

Edward J. Cholinski, Wayland, Mass., assignor to Epicor Technology, Inc., Wayland, Mass.

Division of Ser. No. 123,790, Nov. 23, 1987, Pat. No. 4,938,994. This application Feb. 23, 1990, Ser. No. 484,518

Int. Cl.[5] B05C *5/00, 5/02*

U.S. Cl. 118—683 **22 Claims**



1. A bead coating apparatus for applying a layer of liquid with a controlled volume per unit area of the liquid to a substrate, said apparatus comprising:

A. a source of a liquid;

B. a liquid containing chamber;

C. an applicator slot in liquid communication with said liquid containing chamber, said applicator slot having a set of applicator lips that define an applicator slot exit aperture;

D. means for fluidly coupling said source of a liquid to said liquid containing chamber;

E. means for moving a substrate and the applicator slot exit aperture into proximity with each other;

F. means for sending a controlled volumetric flowrate of liquid from the source of the liquid to the liquid containing chamber and through the applicator slot and then out of the applicator slot exit aperture to create a uniform volumetric flowrate of liquid exiting from each point along the applicator slot exit aperture;

G. means for generating a pulse to control the formation of a connecting bead of liquid coating on the substrate; and,

H. means for relatively moving the substrate and the applicator slot exit aperture with respect to each other to apply a controlled volume per unit area of the liquid to the substrate.

5,183,509

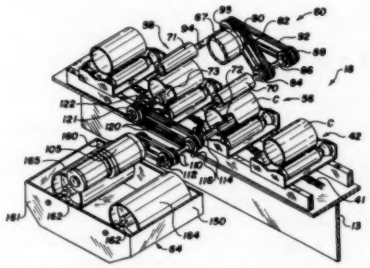
APPARATUS FOR APPLICATION OF A MATERIAL TO AN INTERNAL SURFACE OF ITEMS OF MANUFACTURE

Robert L. Brown, Hartville; David E. Baxter, Ravenna, and Todd A. England, North Canton, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Filed Apr. 26, 1991, Ser. No. 692,100

Int. Cl.[5] B05C *1/02, 17/06*

U.S. Cl. 118—696 **6 Claims**



1. An apparatus for application of a material to the internal surface of cylindrical items of manufacture,

said apparatus comprising a frame, a transport system, an application system, and a curing system for curing material applied to said cylindrical items of manufacture,

said frame supports said transport system

said transport system comprises a continuous conveyor system with a plurality of work stations movably supporting said cylindrical items and transporting said items supported within said work stations to said application system and said curing system,

each of said work stations including first and second horizontally, axially spaced support rolls secured to said conveyor system,

said application system comprising a drive roll vertically movable into driving engagement with said cylindrical item supported within said work station, a vertically and horizontally movable coating roll engagable with said internal surface of said cylindrical item to apply the desired material and with a reservoir system having a rotatable supply roll supplying said coating roll with material,

said coating roll of said application system being movable between a first position engaged with said cylindrical item for applying material to said internal surface thereof during movement of said drive roll, and a second position engaged with said supply roll of said reservoir system.

5,183,510

APPARATUS AND PROCESS FOR CHEMICAL VAPOR DEPOSITION

Takafumi Kimura, Hiratsuka, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 30, 1989, Ser. No. 443,317

Claims priority, application Japan, Nov. 30, 1988, 63-305264

Int. Cl.[5] C23C *16/46*

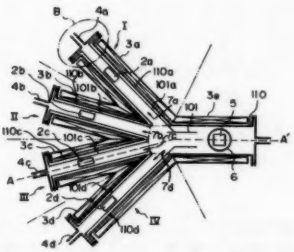
U.S. Cl. 118—719 **17 Claims**

1. An apparatus for a chemical vapor deposition of a compound film on a substrate, comprising:

a plurality of gas-generating chambers each containing an

evaporating boat for a solid source containing a component element of a compound film to be formed on a substrate, each of said gas-generating chambers provided with a heating element for heating and evaporating said solid source, and each of said gas-generating chambers having an inlet for a carrier gas for carrying a gas evaporated from said solid source and a gas outlet, and said gas-generating chambers being arranged such that effective gas-generating portions thereof are thermally isolated from each other;

a gas-mixing chamber for mixing gases from said gas-



generating chambers, provided with a heater element for heating a mixed gas passing therethrough and having inlets for gases flowing from said gas-generating chambers and an outlet for a gas mixture, the heating elements of said gas-generating chambers and said gas-mixing chamber being located continuously over a region from said gas-generating chambers to said gas-mixing chamber; and

a film-growing chamber containing a substrate on which a compound film is formed by a vapor phase reaction, provided with a heating element for heating the substrate, and having an inlet for a gas mixture flowing from said gas-mixing chamber and an exhaust gas outlet.

5,183,511

PHOTO CVD APPARATUS WITH A GLOW DISCHARGE SYSTEM

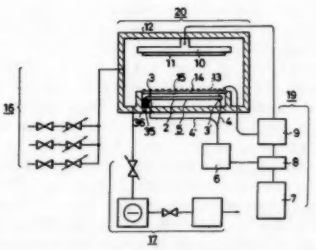
Shunpei Yamazaki, Tokyo; Shigenori Hayashi, Atsugi; Takashi Inujima, Atsugi, and Naoki Hirose, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 76,399, Jul. 22, 1987, abandoned. This application May 12, 1989, Ser. No. 352,644

Claims priority, application Japan, Jul. 23, 1986, 61-174275; Sep. 24, 1986, 61-226447

Int. Cl.[5] C23C *16/48*

U.S. Cl. 118—723 **12 Claims**



1. A photo enhanced CVD apparatus comprising:

a reaction chamber;

a vacuum pump for evacuating said reaction chamber;

a reactive gas introducing system for inputting a reactive gas into said reaction chamber;

a holder for holding a substrate in said reaction chamber;

a light source provided for radiating light to the inside of said reaction chamber through a light window;

a pair of electrodes disposed in said reaction chamber wherein one of said electrodes is a conductive mesh disposed on said light window; and

a power supply for supplying electric power both to said light source and to said electrodes.

5,183,512

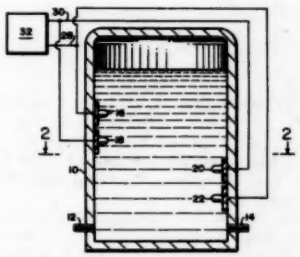
METHOD OF CLEANING SEMICONDUCTOR WAFER AND COMPUTER DISKS BY PURIFIED WATER TREATED WITH ELECTRIC AC SIGNAL

Barry L. Bragger, Colchester, Conn., assignor to Aquotech, Inc., Colchester, Conn.

Filed Aug. 29, 1991, Ser. No. 751,909

Int. Cl.[5] B08B *3/04;* **C02F** *1/48*

U.S. Cl. 134—1 **12 Claims**



1. A method of cleaning semiconductor wafers, comprising the steps of:

(a) treating purified water with an electrical AC signal to alter its cleansing characteristics; said AC signal being at a frequency in the range of 0.1 KHz to 1 GHz,

(b) rinsing a semiconductor wafer with the treated, purified water to remove contaminants.

5,183,513

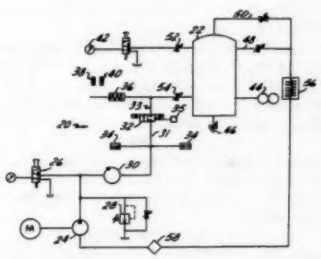
METHOD OF CLEANING INTERNAL SURFACES UTILIZING CAVITATING FLUID

Ronald Sajewski, Rochester, Mich., assignor to Applied Hydro Dynamics, Inc., Rochester, Mich.

Filed May 10, 1991, Ser. No. 698,157

Int. Cl.[5] B08B *9/093*

U.S. Cl. 134—22.12 **19 Claims**



1. A method of cleaning internal surfaces within a vessel comprising the steps of:

(1) cyclically directing pulses of a pressurized fluid into the vessel, such that the pulses impact upon internal surfaces to be cleaned the pulsing of the fluid being created by cyclically operating a valve, and disposing a wave sensor on a fluid line between the valve and the vessel, the wave

sensor delivering a feedback signal to a controller for the valve, and controlling the valve in response to the feedback to maintain a desired frequency; and

(2) directing the fluid out of the vessel.

5,183,514

PROCESS FOR DISSOLVING OR REMOVING RIGID POLYURETHANE FOAM BY CONTACTING WITH 1,2-DIMETHYL IMIDAZOLE

Edward T. Marquis; George P. Speranza, and Wei-Yang Su, all of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Apr. 1, 1991, Ser. No. 677,927

Int. Cl.[5] C11D *1/50, 7/32, 7/50;* **C23G** *5/02*

U.S. Cl. 134—38 **10 Claims**

1. A process for dissolve rigid polyurethane foam, comprising the step of contacting rigid polyurethane foam with 1,2-dimethyl imidazole for a period of time sufficient to dissolve substantially all of the rigid polyurethane foam.

5,183,515

FIBROUS ANISOTROPIC PERMANENT MAGNET AND PRODUCTION PROCESS THEREOF

Shuji Ueno; Michiaki Hagiwara, both of Kyoto; Ryoji Mishima, and Kiyoshi Isoishi, both of Kanagawa, all of Japan, assignors to Unitika Ltd., Hyogo and Mitsubishi Kasei Corporation, Tokyo, both of, Japan

Division of Ser. No. 609,843, Nov. 7, 1990, Pat. No. 5,135,585. This application Mar. 31, 1992, Ser. No. 860,992

Claims priority, application Japan, Nov. 7, 1989, 1-289446

Int. Cl.[5] H01F *1/02*

U.S. Cl. 148—101 **2 Claims**

1. A process of preparing anisotropic permanent magnet fibers having a mean diameter of from 50 to 1,000 μm and exhibiting magnetic anisotropy, comprising extruding a molten alloy comprising at least one rare earth metal selected from the group consisting of Nd, Pr, Dy, Ho, Tb, La, and Ce in an amount of from 8 to 30 atom %; Fe in an amount of from 12 to 90 atom %; B in an amount of from 2 to 28 atom %; and not more than 30 atom % of Co, into an oil having a viscosity of from 1 to 1,000 c.p. to quench-solidify the molten alloy into a fibrous form.

5,183,516

MAGNETIC MATERIALS AND PERMANENT MAGNETS

Masato Sagawa, Ibaraki; Setsuo Fujimura, Kyoto, and Yutaka Matsuura, Hyogo, all of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Continuation of Ser. No. 725,614, Jul. 3, 1991, abandoned, which is a division of Ser. No. 224,411, Jul. 26, 1988, Pat. No. 5,096,512, Division of Ser. No. 13,615, Feb. 10, 1987, Pat. No. 4,770,723, which is a continuation of Ser. No. 510,234, Jul. 1, 1983, abandoned. This application Apr. 30, 1992, Ser. No. 877,400

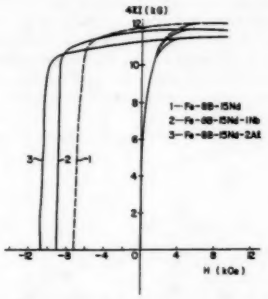
Claims priority, application Japan, Aug. 21, 1982, 57-145072; Nov. 15, 1982, 57-200204; Jan. 19, 1983, 58-5814; Mar. 8, 1983, 58-37896; Mar. 8, 1983, 58-37898; May 14, 1983, 58-84859; May 31, 1983, 58-94876

Int. Cl.[5] C22C *38/00*

U.S. Cl. 148—302 **5 Claims**

1. A permanent magnet alloy consisting essentially of, in atomic percent, 12–20% R, 4–24% B and the balance Fe, wherein R is selected from the group of at least one of mischmetal and didymium,

wherein the alloy has a major phase of an Fe-B-R compound of a substantially tetragonal crystal structure, said compound being stable at room temperature and above, having a Curie temperature higher than room temperature and having magnetic anisotropy, and in which crystal



grains of said Fe-B-R compound are isolated by a non-magnetic boundary phase.

5,183,517

PERMANENT MAGNET COMPOSITION

Takaaki Yasumura; Teruo Kiyomiya, both of Kosai; Yasutoshi Mizuno, and Kazuo Matsui, both of Toyohashi, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 446,622, Dec. 6, 1989, abandoned. This application Sep. 11, 1991, Ser. No. 759,130

Claims priority, application Japan, Dec. 8, 1988, 63-308720

Int. Cl.[5] H01F *1/04*

U.S. Cl. 148—303 **2 Claims**

1. A permanent magnet composition comprising: 22 to 28 wt % R, R being at least one of rare earth elements including yttrium; 5 to 16 wt % iron; 0.2 to 6.5 wt % copper; 0.1 to 6 wt % manganese; 0.5 to 6 wt % A, A being at least one element selected from the group of zinc and zirconium; 0.1 to 2.5 wt % thallium; and the balance being cobalt.

5,183,518

CRYOGENICALLY SUPER-HARDENED HIGH-CHROMIUM WHITE CAST IRON AND METHOD THEREOF

Roman Radon, Belleview, Fla., assignor to Townley Foundry & Machine Co., Inc., Candler, Fla.

Continuation of Ser. No. 658,351, Feb. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 345,696, May 1, 1989, abandoned. This application Feb. 6, 1992, Ser. No. 830,464

Int. Cl.[5] C21D *5/04;* **C22C** *38/36*

U.S. Cl. 148—324 **22 Claims**

1. A process for making a high-chromium white cast iron alloy, said process comprising the steps of:

(1) preparing a molten metal composition having an elemental analysis in percent by weight of the total consisting essentially of 2.4 to 3.8% carbon, 0.4 to 2.0% manganese, 0.2 to 1.9% silicon, 0.0 to 3.0% copper, 1.5 to 4.5% nickel, 12.0 to 29.0% chromium, and the remainder being iron;

(2) pouring the molten metal composition into a mold to form a casting and cooling the casting to room temperature without precipitation of substantial amounts of secondary carbides in the matrix of the casting; and,

(3) placing the room temperature casting in a cooling medium at a cryogenic temperature of about −55° C. or less for a time sufficient to cause the casting to have a hardness of at least about 700 HB, said cryogenic cooling being carried out without prior heating of the room temperature casting sufficient to cause precipitation of substantial amounts of secondary carbides in the matrix of the casting, and said hardened casting having a martensitic matrix which is substantially free of precipitated secondary carbides.

5,183,519

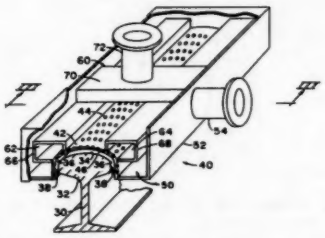
METHOD FOR QUENCHING RAILWAY RAIL HEADS

Emmerich E. Wechselberger, Glen Ellyn, and Ralph S. Frost, Olympic Fields, both of Ill., assignors to Chemetron-Railway Products, Inc., Wheeling, Ill.

Continuation of Ser. No. 447,234, Dec. 7, 1989, abandoned, which is a division of Ser. No. 27,766, Mar. 19, 1987, Pat. No. 4,938,460. This application Jun. 6, 1991, Ser. No. 711,632

Int. Cl.[5] C21D *1/20, 1/62*

U.S. Cl. 148—582 11 Claims



1. A method of air quenching the heated head of an axially moving railway rail from austenizing temperatures to develop a pearlite microstructure in the head, and wherein the rail head has a top running surface, laterally opposite side surfaces, and a shoulder surface between each side surface and the top running surface, said method comprising the steps of:

passing the rail head longitudinally through a plurality of quenching units which are longitudinally aligned and each of which includes first housing means defining primary quenching fluid chambers having fluid discharge means operative to confront only the top and side surfaces of the rail head when passed through the quenching units, and second housing means defining a pair of secondary quenching fluid chambers having fluid discharge means operative to confront only the shoulder surfaces of the rail head when passed longitudinally through the quenching units;

introducing quenching air into the primary and secondary chambers of the first of the aligned quench units so as to cool only the top and side surfaces of the rail head at a first cooling rate and simultaneously cool only the shoulder surfaces of the rail head at a lower cooling rate; and

introducing quenching air into the primary and secondary chambers of each successive quench unit so as to cool only the top and side surfaces of he rail head at a progressively faster cooling rate in each successive quenching unit, and simultaneously cool only the shoulder surfaces of the rail head in each successive quench unit at a lower rate than the cooling rate for the top and side surfaces.

5,183,520

EXPLOSIVE CHARGE

Paul Wanninger, Schrobenhausen; Richard Wild, Karlshuld; Ernst Kleinschmidt, and Helmut Späth, both of Schrobenhausen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

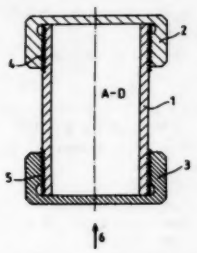
Filed Mar. 5, 1991, Ser. No. 665,404

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1990, 4006961

Int. Cl.[5] C06B *45/10*

U.S. Cl. 149—19.91 1 Claim

1. An explosive charge, comprising a pressed plastic bonded explosive charge pressed to provide a density greater than 92% of a theoretical maximum density, said pressed plastic bonded explosive charge including a plastic binder forming 5–2 wt. % of said pressed plastic bonded explosive charge, said binder having a 1:1 mixture of di-2-ethylhexyl adipate (DOA)



and ethylene-vinyl-acetate polymer (EVA) and including an explosive charge component of 95–98 wt. %.

5,183,521

PROCESS AND APPARATUS FOR PRODUCING SPLINED DRIVING BELTS

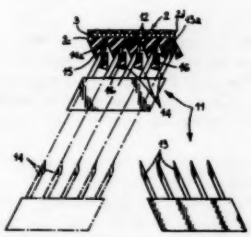
Alberto Ruffini, and Nicolino Mammarella, both of Chieti, Italy, assignors to Pirelli Trasmissioni Industriali S.p.A., Chieti, Italy

Filed Apr. 22, 1991, Ser. No. 688,281

Claims priority, application Italy, Apr. 24, 1990, 20115 A/90

Int. Cl.[5] F16G *5/00*

U.S. Cl. 156—142 13 Claims



1. A process for producing splined driving belts, comprising the following steps:

a) making a flexible annular element of an elastomeric vulcanized material having a flattened rectangular section with two major sides and incorporating at least one reinforcing layer extend[i]ng parallel to the major sides of said section to a predetermined distance from an operating surface defined by at least one of said major sides along the length of the flexible annular element;

b) mounting the flexible annular element to at least one support roller;

c) moving the flexible annular element with a uniform movement in the direction of its length by rotation of said at least one support roller;

d) pushing a first set of parallel knives, which are positioned to be equally spaced apart from each other, into said operating surface according to a first direction inclined relative to the operating surface and to a depth less than the distance between the textile reinforcing layer and the operating surface itself to define a first series of longitudinal cuts;

e) moving the first set of parallel knives away from said annular element to a first rest position displaced from the operating surface;

f) and subsequently pushing a second set of parallel knives which are positioned to be equally spaced apart from each other into said operating surface according to a second direction inclined relative to the first direction, said knives

meeting each one of the first longitudinal cuts and defining a second series of longitudinal cuts whereby a series of grooves is formed on the operating surface;

g) moving the second set of parallel knives away from said annular element to a second rest position displaced from the operating surface.

5,183,522

APPARATUS AND PROCESS FOR A MANUFACTURING A WEATHER STRIP

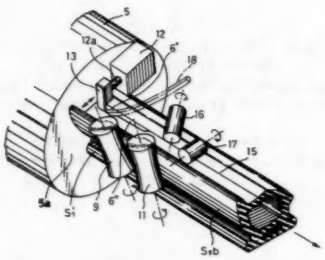
Hidetoshi Arima, Obu, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Obu, Japan

Division of Ser. No. 611,940, Nov. 13, 1990, Pat. No. 5,067,280. This application Sep. 19, 1991, Ser. No. 762,482

Claims priority, application Japan, Nov. 14, 1989, 1-295616; Nov. 22, 1989, 1-303756

Int. Cl.[5] **B29C** *47/00;* **B22B** *31/18*

U.S. Cl. 156—244.13 **12 Claims**



1. A process for manufacturing a weather strip having a plurality of weather strip portions, wherein one of the weather strip portions has larger circumferential length than that of the other weather strip portions and wherein all of the weather strip portions are integrally formed as a unit, comprising the steps of:

extruding a molding material from an extruding opening formed on a molding die;

partly cutting off said extruded molding material to form a longitudinal slit thereon after said molding material is extruded from said opening for a length equal to that of said one of the weather strip portions having larger circumferential length;

pressing said extruded and slitted molding material to close said slit so that the other weather strip portions having smaller circumferential length are integrally formed with said one of the weather strip portions.

5,183,523

APPARATUS FOR ULTRASONICALLY BONDING ENDCAPS TO A CONTAINER OF DISSIMILAR MATERIAL

Steven R. Rinehart, Midlothian, and Jonah Adams, Jr., Chesterfield, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 15, 1990, Ser. No. 567,806

Int. Cl.[5] **B31B** *1/64*

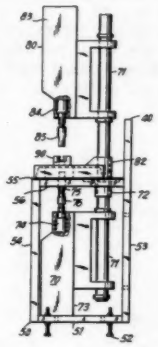
U.S. Cl. 156—367 **13 Claims**

1. Apparatus for ultrasonically sealing a food or tobacco container comprised of a tube and an endcap, said endcap engaged with said tube, said apparatus comprising:

a. a frame;

b. a work block having a hole therethrough, said work block mounted on said frame;

c. a pair of ultrasonic devices having acoustical horns, the acoustical horns being opposingly mounted on said frame so that when said acoustical horns of said ultrasonic devices are in contact with said container, one of said acoustical horns extends through said hole in said work block;



d. means for synchronizing and monitoring the operation of said ultrasonic devices.

5,183,524

DEVICE FOR INSERTION BY WELDING OF A PLASTIC PIPE SECTION INTO A SHAPED PLASTIC PIECE

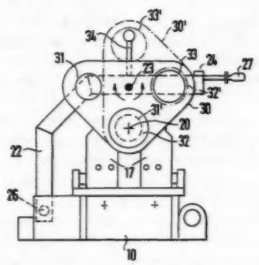
Armin Dommer, Eichweg 13, and Dieter Dommer, Bahnhofstr. 5, both of 7257 Ditzingen, Fed. Rep. of Germany

Filed Apr. 2, 1991, Ser. No. 678,845

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1990, 4010541

Int. Cl.[5] **B29C** *65/18*

U.S. Cl. 156—423 **8 Claims**



1. In an apparatus for inserting a plastic pipe section into a shaped plastic piece for welding according to a heating element method, wherein two carriages, each having a clamping element, are mounted on a base frame and can be displaced with respect to each other with a setting device, and a heating device is pivotal into and out of position between the two clamping elements with the clamped plastic pipe section and the clamped shaped plastic piece with levers pivotally mounted to the base frame, and the heating device has a heating element with a cupped section for placing over the plastic pipe section and a cylindrical section for insertion into the shaped plastic piece, the improvement comprising:

the heating device **(30)** having a plurality of different heating elements **(31, 32, 33)**, each with a cupped section and a cylindrical section;

the heating device **(30)** rotatably mounted with respect to the pivot levers **(21, 22)** such that with the heating device **(30)** in a set position the heating elements **(31, 32, 33)** are rotatable between the two clamping elements **(14, 17)** which hold the clamped plastic pipe section and the clamped shaped plastic piece;

with the pivot levers **(21, 22)** pivoted into the set position a

rotating shaft (**23**) of the heating device (**30**) positioned vertically above a central axis (**20**) of the clamping elements (**14, 17**) and vertically above the clamped plastic pipe section and the clamped shaped plastic piece;

the heating elements (**31, 32, 33**) are positioned within the heating device (**30**) with each center axis of each of the heating elements (**31, 32, 33**) arranged on a circumferential path around the rotating shaft (**23**) of the heating device (**30**), and a radius of the circumferential path is equal to a distance from a shaft center of the rotating shaft (**23**), when pivoted into the set position, to the central axis (**20**) of each of the respective clamping elements (**14, 17**); and

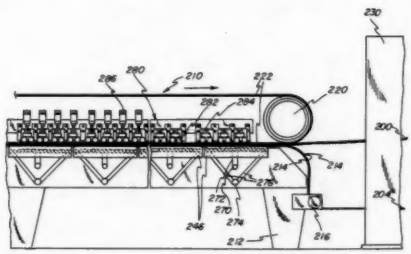
the two pivot levers (**21, 22**) are pivotally mounted on a back portion of the base frame (**10**), each of the pivot levers (**21, 22**) having a horizontal section extending between a corresponding clamping element of the two clamping elements (**14, 17**) when the heating device (**30**) is pivoted into the set position, and the heating device (**30**) positioned between each of the horizontal sections of the pivot levers (**21, 22**).

5,183,525

HEATER FOR A DOUBLE FACING CORRUGATING MACHINE

Charles E. Thomas, Baltimore, Md., assignor to United Container Machinery Group, Inc., Glen Arm, Md.

Filed May 24, 1990, Ser. No. 528,294
Int. Cl.[5] B31F *1/28*
U.S. Cl. 156—470 **18 Claims**



1. A heating apparatus for imparting heat to paper board passing over an upper surface of the heating apparatus, the heating apparatus comprising:

at least one discrete plate having end faces, and an upper surface and a lower surface;

side-by-side channels extending between one end of the plate and an opposite end, the channels being proximate to the upper surface of the plate, thereby forming a thin web of material between the channels and the upper surface, and a thick web of material between the channels and the lower surface to thereby rigidify the plate, said channels being integrally formed in said at least one discrete plate;

means to interconnect adjacent pairs of channels at alternate ends thereby forming a continuous serpentine passageway between said ends in said discrete plate and parallel to the plane of the upper surface;

at least one heat inlet port in said lower surface, said inlet port communicating with the serpentine passageway;

at least one heat outlet port in said lower surface, said inlet port communicating with the serpentine passageway; and

means for imparting a force on said cardboard as it passes said upper surface, said imparting means being capable of supporting the cardboard above said upper surface and also being capable of securing said cardboard against said upper surface; said upper surface of said plate being in direct operative relationship with said cardboard as it passes over said upper surface;

said heating apparatus further comprising strengthening ribs fixed to the lower surface of the plate to further rigidify the plate, said strengthening ribs each lying in a second plane which is generally perpendicular to the plane of said upper surface, said pair of strengthening ribs each having at least one steam passage therethrough and interconnected to the serpentine path in order to heat the strengthening ribs to facilitate minimizing distortion of said plate, said pair of strengthening ribs forming side walls of a chamber which cooperate with said air passages to support said corrugated cardboard either above said upper surface or against said upper surface.

8. In an apparatus for the manufacture of double face corrugated board, where the apparatus includes means to first produce a single face corrugated board from a medium paper and a first liner paper, receive and precondition the single face corrugated board and a second liner paper, and merge the single face corrugated board and second liner paper together with adhesive applied therebetween, a heating means for gelatinizing the single face corrugated board and second liner paper together, comprises:

a plurality of heating plates aligned side-by-side in a longitudinal array, each plate having an upper and lower surface extending between end faces of the plate, a plurality of channels extending through the plates between the end faces, the channels being parallel to and proximate the upper surfaces of the plates, thereby forming a thin web of material between the channels and the upper surfaces, and a thick web of material between the channels and the lower surfaces to rigidify the plates, the channels being integrally formed in each plate and each plate being interconnected to form a serpentine path circulating through each of the plates, each of the plates further comprising a steam inlet port and a steam outlet port in their lower surface and communicating with the serpentine path to provide a supply of circulating steam to the serpentine path; and

at least some of said discrete plates comprising means for imparting a force on said cardboard as it passes said upper surface, said imparting means being capable of supporting the cardboard above said upper surface and also being capable of securing said cardboard against said upper surface; said upper surface of said plate being in direct operative relationship with said cardboard as it passes over said upper surface;

said imparting means comprising air passages in said discrete plate communicating between the upper and lower surfaces, intermediate some of the channels;

each of said discrete plates lies in a first plane and comprises a pair of strengthening ribs secured to said lower surface, said strengthening ribs each lying in a second plane which is generally perpendicular to the first plane, said pair of strengthening ribs each having at least one steam passage therethrough and interconnected to the serpentine path in order to heat the strengthening ribs to facilitate minimizing distortion of said plate, said pair of strengthening ribs forming side walls of a chamber which cooperate with said air passages to support said corrugated cardboard either above said upper surface or against said upper surface.

5,183,526

REPAIR SEALER ACCESSORY

George E. Walter, Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Sep. 26, 1991, Ser. No. 765,814
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—556 **16 Claims**

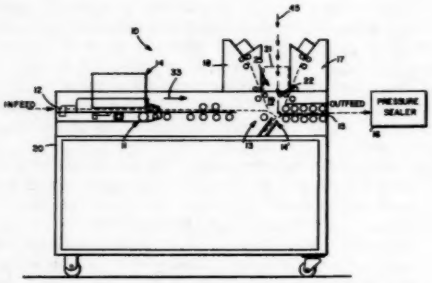
1. Apparatus for handling business forms, comprising:

conveyor means for conveying business forms to a folder, said conveyor means including a first, infeed, end, and a second end adjacent said folder, said conveyor means conveying forms in a direction of conveyance from said first to said second ends thereof;

a housing for containing said conveyor means, said housing

means defining an opening portion adjacent the area between said conveyor means and folder; and

form introduction means disposed at said opening portion, for covering said opening portion, and allowing bypass of said conveyor first end to allow introduction of individual forms directly into the area between said conveyor means and folder, said form introduction means comprising: a



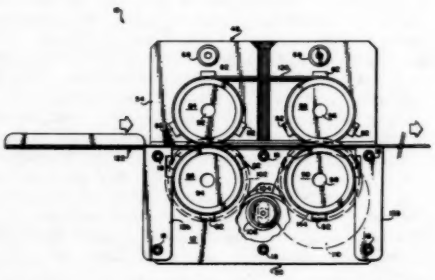
plate; means defining a slot in said plate perpendicular to the direction of conveyance of said conveyor means; adjustable form guide means associated with said slot to provide an adjustable guided width of said slot for introduction of forms; and surface means formed on said plate allowing movement of said plate from a first position covering said opening to a second position not covering said opening.

5,183,527

PERIMETER PRESSURE SEAL MODULE

Rebecca L. Parker, Grand Island, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Apr. 12, 1991, Ser. No. 684,273
Int. Cl.[5] B32B *31/04*
U.S. Cl. 156—555 **39 Claims**



1. A pressure sealer for activating a pressure sensitive adhesive strip between at least a pair of form parts comprising:

a first frame;

at least a first pair of cooperating sealer wheels having first and second peripheral sealing surfaces, respectively, said sealer wheels rotatably mounted in said first frame;

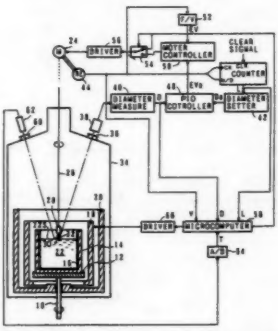
means for causing one of the first and second peripheral sealing surfaces to assume a non-parallel orientation with respect to the other of the first and second peripheral sealing surfaces when no form parts are present between the sealer wheels, and for causing the first and second peripheral sealing surfaces to assume a substantially parallel orientation when the form parts are introduced between the sealer wheels, said means exerting compressive force between said first and second peripheral sealing surfaces sufficient to activate the pressure sensitive adhesive strip when the form parts are introduced between the sealer wheels.

5,183,528

METHOD OF AUTOMATIC CONTROL OF GROWING NECK PORTION OF A SINGLE CRYSTAL BY THE CZ METHOD

Masahiko Baba, Annaka, and Hiroshi Ohtsuna, Sabae, both of Japan, assignors to Shin-Etsu Handotai Company, Limited, Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 661,348
Claims priority, application Japan, Feb. 28, 1990, 2-48934
Int. Cl.[5] C30B *15/26*
U.S. Cl. 156—601 **5 Claims**



1. A method of automatic control of growing a single crystal neck portion between a seed crystal and a corn portion of the single crystal by the CZ method, comprising the steps of:

(110, 112) pulling up the seed crystal (30) from the lowest initial point with a constant speed for a first set period of time, less than the total time, before measuring crystal diameter to grow the single crystal (32), said crystal contacting with the surface (22S) of a melt (22) contained in a crucible (16);

(113) measuring the diameter of the lower end of said single crystal after said period has elapsed;

(114) modifying an electric power supplied to a heater (18) for heating said melt based on the difference between the measured diameter and a reference value;

waiting a period of time without pulling up said crystal (116) and alternately repeated steps of:

maintaining constant, for a second set period of time, an electric power supplied to a heater for heating a melt contained in a crucible;

controlling a pulling up speed of the single crystal growing from said melt such that a diameter of the lower end of the single crystal will approach a reference value during said period;

measuring said speed repeatedly during said period (118–124); and

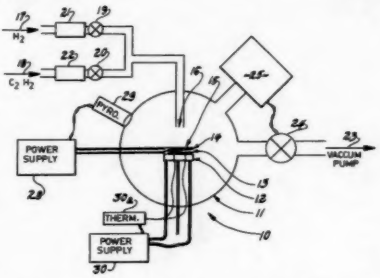
modifying said power supply based on the difference between the mean value of said speed and a reference value after said period (126–130).

5,183,529

FABRICATION OF POLYCRYSTALLINE FREE-STANDING DIAMOND FILMS

Timothy J. Potter, Dearborn, Mich.; Michael A. Tamor, Toledo, Ohio, and Ching-Hsong Wu, Farmington Hills, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 29, 1990, Ser. No. 604,692
Int. Cl.[5] C30B *25/00*
U.S. Cl. 156—613 11 Claims



1. A method of fabricating free-standing diamond films, comprising

(a) depositing and adhering polycrystalline diamond film by hot filament chemical vapor deposition onto a substrate meltable at a temperature slightly in excess of the deposition temperature; and

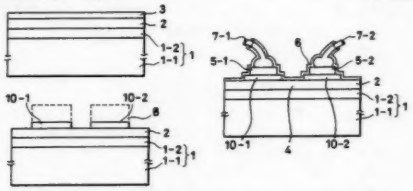
(b) prior to cooling said polycrystalline diamond films, increasing the substrate temperature by conductance heating to melt at least a portion thereof while permitting such melt to emigrate from the diamond films.

5,183,530

METHOD OF MANUFACTURING DIAMOND THERMISTORS

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Sep. 10, 1990, Ser. No. 579,536
Claims priority, application Japan, Sep. 11, 1989, 1-235139
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 18 Claims



1. A method of manufacturing thermistors comprising:

forming an impurity diamond film on a temperature sensing diamond substrate;

selectively removing said impurity diamond film in order to leave a pair of contact regions; and

forming a pair of electrodes respectively on the pair of said contact regions.

5,183,531

DRY ETCHING METHOD

Shingo Terakado, Tsukuba, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

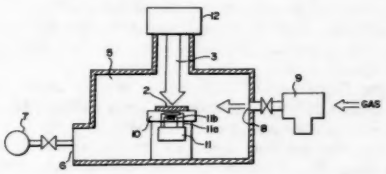
Filed Aug. 9, 1990, Ser. No. 565,264
Claims priority, application Japan, Aug. 11, 1989, 1-208095; Mar. 27, 1990, 2-77944; Apr. 25, 1990, 2-109110
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—643 2 Claims

1. A dry etching method comprising the steps of:

(a) activating an etching gas consisting of SF_6 and Ar by using a microwave;

(b) disposing an etch-proof photomask having an opening above a surface of a processing material composed of Si to be etched so that the mask is spaced from the surface; and

(c) irradiating a photon beam of vacuum ultraviolet radiation, for exciting a reaction, onto the surface of the processing material to be etched in a condition that there exists an activated etching gas, thereby achieving an etching of said processing material to be etched in an area selected by the opening in the photomask to be irradiated by said photon beam, and cooling said processing material simultaneously with irradiating by said photon beam.



5,183,532

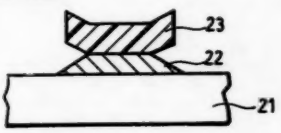
Patent Not Issued For This Number

5,183,533

METHOD FOR ETCHING CHROMIUM FILM FORMED ON SUBSTRATE

Michinari Tsutsumi; Atsushi Endo, and Toshio Yada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 249,905, Sep. 27, 1988, Pat. No. 5,007,984. This application Oct. 17, 1990, Ser. No. 599,782
Claims priority, application Japan, Sep. 28, 1987, 62-245035; Oct. 7, 1987, 62-253423
The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.
Int. Cl.[5] C23F *1/00*
U.S. Cl. 156—656 3 Claims



1. A method for etching a chromium film formed on a substrate, comprising the steps of:

(a) providing a chromium film formed on a substrate,

(b) forming a coating film having a predetermined pattern on the chromium film, to selectively expose the chromium film, and

(c) etching the exposed chromium film with an etchant comprising at least 2 mol/l of nitric acid, the concentration of nitric acid in the etchant and the temperature of the etchant being sufficient to cause a decrease in the contact area of the chromium film with the coating film, whereby sidewall surfaces of a remaining pattern of the etched chromium film are tapered.

5,183,534

WET-ETCH PROCESS AND COMPOSITION

Douglas E. Fjare, Naperville; Allyson J. Beuhler, Indian Head Park, and Cynthia A. Navar, Aurora, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 491,438, Mar. 9, 1990, abandoned. This application Oct. 30, 1990, Ser. No. 605,555
Int. Cl.[5] B05D *5/00*
U.S. Cl. 156—668 15 Claims

10. A process for selectively etching a polyamic acid layer or a partially cured polyamic acid layer comprising

a) applying a layer of polyamic acid to a substrate;

b) applying a layer of positive photoresist material to the polyamic acid layer;

c) shielding the layer of photoresist material with a mask having a pattern of openings that are positioned where the photoresist material is to be removed;

d) exposing the photoresist material to actinic radiation through the pattern of openings in the mask to produce areas of exposed photoresist material and unexposed photoresist material;

e) removing the mask;

f) developing and removing the exposed photoresist material to reveal areas of the polyamic acid;

g) etching the revealed polyamic acid with a wet-etch composition of an aqueous solution comprising at least 50 weight percent of the total composition of water, a substituted hydrocarbon solvent and an alkylamine wherein the weight ratio of the substituted hydrocarbon solvent to the alkylamine is about 0.1–49:49–0.1, with the proviso that the composition contains less than 1.0 percent ionic base;

h) developing and removing the photoresist material; and

i) imidizing the polyamic acid to a polyimide.

5,183,535

PROCESS FOR PREPARING KRAFT PULP USING BLACK LIQUOR PRETREATMENT REACTION

Panu Tikka, Kantvik, Finland, assignor to Sunds Defibrator Rauma Oy, Finland

Continuation of Ser. No. 563,438, Aug. 7, 1990, abandoned. This application Nov. 19, 1991, Ser. No. 794,795
Claims priority, application Finland, Feb. 9, 1990, 900663
Int. Cl.[5] D21C *1/06, 11/00*
U.S. Cl. 162—19 21 Claims

1. A process for the preparation of kraft pulp from lignin-containing cellulosic material comprising the steps of:

filling a vessel containing cellulosic material with an alkaline cooking liquor having a pH of between about 11.5 and about 13.5 and consisting essentially of spent kraft cooking liquor;

impregnating said cellulosic material with said alkaline cooking liquor under positive pressure for a period of time sufficient to provide an equalization of impregnation of said cellulosic material with said alkaline cooking liquor and to essentially fill said cellulosic material with said alkaline cooking liquor, said alkaline cooking liquor being maintained at an impregnation temperature which will avoid reaction between said cooking liquor and said cellulosic material;

subjecting said essentially filled, impregnated cellulosic material to a pretreatment reaction wherein the impregnated alkaline cooking liquor reacts with said cellulosic material under conditions sufficient to lower the pH of said alkaline cooking liquor to between about 9 and about 11 whereby the pretreated cellulosic material is now capable of being delignified under relatively mild delignifying conditions; and

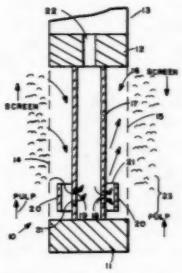
delignifying said pretreated cellulosic material with fresh alkaline cooking liquor.

5,183,536

ATMOSPHERIC DIFFUSER IMPROVED LOWER SCREENS BACKFLUSHING

Joseph Phillips; J. Robert Prough; Victor L. Bilodeau; Brian Greenwood; Ronald Bain, and John Weston, all of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Division of Ser. No. 628,090, Dec. 17, 1990, Pat. No. 5,116,476. This application Mar. 13, 1992, Ser. No. 850,522
Int. Cl.[5] D21C *3/22*
U.S. Cl. 162—57 10 Claims



1. A method of treating cellulosic fibrous material pulp in an upright vessel having at least one annular screen having a first end and a second end, the axis of the annular screen being vertical, comprising the steps of:

(a) causing the pulp to flow in a first vertical direction in the vessel, the pulp when flowing in the first direction initially encountering the second end of the screen, and the flowing to and past the first end thereof, some liquid in the pulp passing through the screen;

(b) withdrawing liquid flowing through the screen from the vessel;

(c) periodically causing a flow of backflushing liquid back through the screen into the pulp; and

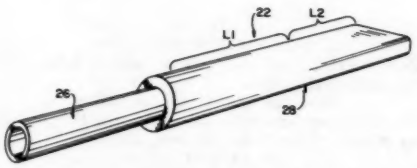
(d) controlling the backflushing liquid so that the liquid backflushing the screen at the first end thereof is liquid that has passed through the screen substantially at the first end of the screen, the liquid backflushing the screen at the first end thereof having substantially the same properties as liquid withdrawn at the screen first end.

5,183,537

HEADBOX TUBE BANK APPARATUS AND METHOD OF DIRECTING FLOW THERETHROUGH

Richard E. Hergert; Richard R. Hergert, both of Rockton; Eugene B. Neill, South Beloit, all of Ill.; Scott B. Pantaleo; Arnold J. Roerig, both of Beloit, Wis.; Thomas D. Rogers, Roscoe, Ill.; Jay A. Shands, Beloit, Wis., and Noriaki Takeguchi, Rockton, Ill., assignors to Beloit Technologies, Inc., Wilmington, Del.

Filed Oct. 7, 1991, Ser. No. 772,521
Int. Cl.[5] D21F *1/02*
U.S. Cl. 162—216 14 Claims



1. A headbox tube bank apparatus for the flow therethrough of stock in a papermaking machine, said apparatus comprising:

a tube bank frame for rigidly supporting the tube bank, said frame defining a plurality of openings;

a plurality of tubes cooperating with said frame such that each tube of said plurality of tubes extends through and is supported by an opening of said plurality of openings;

each tube of said plurality of tubes having an upstream and a downstream portion, the arrangement being such that the stock flows through said tube from said upstream to said downstream portion;

said upstream portion defining an internal crossmachine direction section of substantially circular configuration for maximizing the velocity of the stock through said tube;

said downstream portion having a first and a second end, said downstream portion converging towards said second end thereof;

said first end of said downstream portion defining an internal cross-section of substantially circular configuration greater than the cross-machine direction circular section of the upstream portion and being connected to said upstream portion; and

said second end of said downstream portion defining a downstream orifice having a flow area in a cross-machine direction which is of substantially flattened rectangular configuration for progressively increasing the uniformity, stability, cleanliness, and for lowering the turbulence of the stock during flow thereof through said downstream portion, said downstream portion being an integral continuous element.

14. A method for directing the flow of stock through a tube bank apparatus of a headbox, said method comprising the steps of:

conducting the flow of stock through an upstream portion of a tube of the tube bank apparatus, the upstream portion having a substantially circular cross-sectional flow area along the length thereof for increasing the velocity of the flow of stock therethrough;

reducing the velocity of the stock during movement through an upstream length of a downstream portion of the tube, the upstream length having a substantially circular cross-sectional flow area along the length thereof, the circular flow area of the upstream length being greater than the circular flow area of the upstream portion; and

changing the cross-sectional flow area from the circular flow area defined by the upstream length of the downstream portion to a substantially converging flattened rectangular cross-sectional flow area along the length of a downstream length of the downstream portion such that the stock flows uniformly through the tube while inhibiting any tendency for the flow of stock adhering to a side wall of the downstream length, the downstream length converging along the length thereof in the flow direction for inhibiting such adherence, said downstream portion being an integral continuous element.

5,183,538
EXTRACTION PLUS ION EXCHANGE PROCESSING OF A BRINE STREAM

Lacey E. Scoggins; Fu M. Lee; Allen T. Chang, all of Bartlesville, Okla., and Wiley D. Perkins, College Station, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

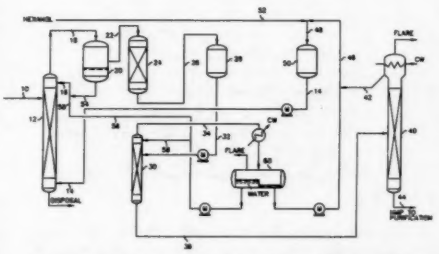
Filed Dec. 24, 1990, Ser. No. 632,721
Int. Cl.[5] B01D *3/14;* **C07D** *207/267*
U.S. Cl. 203—28 **9 Claims**

1. A process for recovering a liquid polymerization reaction diluent having a low salt content from a mixture containing said diluent along with an alkali-metal salt and water, said process comprising the following steps performed in the sequence set forth below:

(a) extracting essentially all of said diluent from said mixture in an extraction column employing an extractant material so as to produce an extract mixture predominantly containing said diluent and said extractant material and further containing said alkali-metal salt and water;

(b) converting a substantial portion of said alkali-metal salt in said extract mixture to an alkali-metal hydroxide in the presence of an ion exchange resin so as to produce an exchange mixture predominantly containing said diluent and said extractant material and also containing said alkali-metal hydroxide and water;

(c) removing essentially all of the water and converting at least a first portion of said alkali-metal hydroxide contained in said exchange mixture to an alkali-metal salt of



aminocarboxylic acid in a first fractional distillation column;

(d) removing essentially all of the extractant material and converting essentially all of the remaining alkali-metal hydroxide in said exchange mixture to an alkali-metal salt of aminocarboxylic acid in a second fractional distillation column; and

(e) recovering said diluent having a low salt content from said second fractional distillation column.

5,183,539
METHOD OF PURIFYING CRUDE GLYCIDYL (METH)ACRYLATE

Akihiro Honma, and Masahiro Kurokawa, both of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Nov. 15, 1991, Ser. No. 793,958
Claims priority, application Japan, Nov. 21, 1990, 2-314305
Int. Cl.[5] B01D *3/34;* **C07D** *301/36*
U.S. Cl. 203—38 **5 Claims**

1. A method of purifying a crude glycidyl acrylate or a crude glycidyl methacrylate, which comprises:

(1) subjecting a crude glycidyl acrylate or a crude glycidyl methacrylate containing, as impurities, epichlorohydrin and other chlorine compounds selected from the group consisting of 1,3-dichloro-2-propanol, 2,3-dichloro-1-propanol, glycerin monochlorohydrin, 2-hydroxy-3-chloropropyl acrylate, 2-hydroxy-3-chloropropyl methacrylate, 3-hydroxy-2-chloropropyl acrylate and 3-hydroxy-2-chloropropyl methacrylate to a stripping treatment with a mixed gas containing oxygen gas in the presence of a quaternary ammonium salt, and then

(2) distilling the treated product to obtain a purified glycidyl acrylate or a purified glycidyl methacrylate,

wherein the mixed gas is used at a flow rate of 0.1 to 500 ml/minute, as a flow rate at 20° C. under atmospheric pressure, per kilogram of the crude glycidyl acrylate or methacrylate.

5,183,540
METHOD FOR RECOVERING SOLVENTS THROUGH THE USE OF AN EXTENDER

Isadore E. Rubin, 247 Tillou Rd., South Orange, N.J. 07079

Filed Sep. 18, 1990, Ser. No. 584,280
Int. Cl.[5] B01D *3/10, 15/00*
U.S. Cl. 203—41 **16 Claims**

1. A method for recovery of solvent from a solvent-based

wash liquid containing paint residue removed from paint making equipment by use of a solvent and for reducing the residue to a non-hazardous waste material, comprising the steps of:

placing the solvent-based wash liquid in a vessel;

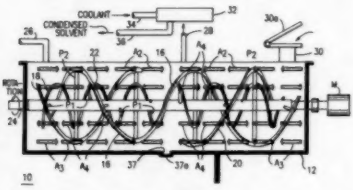
heating said vessel to a temperature sufficient to cause the solvent to boil and evaporate;

drawing off the evaporated solvent from said vessel, and condensing the evaporated solvent;

introducing an extender into the vessel in an amount sufficient to adsorb the residue, said extender being a substantially inert material ground into a granulated consistency, said extender being introduced as a percent of the weight of the residue remaining in said vessel; said percent lying in the range of from 7–20% of the weight of said residue;

continuously tumbling the contents of the vessel by rotating the contents of the vessel in the range of from 5–30 rpm to prevent solid matter from agglomerating; and

drying the contents of the vessel to provide a particulate, free-flowing solid residue having a solvent content of the order of less than ten parts per million.



5,183,541

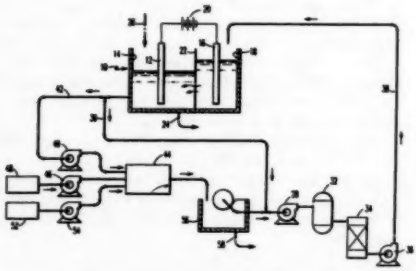
DECONTAMINATION OF RADIOACTIVE METALS

Thomas S. Snyder, Oakmont; William R. Gass, Plum Boro, both of Pa.; Samuel A. Worcester, Butte, Mont.; Laura J. Ayers, and Gregory F. Boris, both of Knoxville, Tenn., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 506,044, Apr. 9, 1990. This application Oct. 2, 1991, Ser. No. 769,998

Int. Cl.[5] C25C *1/06*

U.S. Cl. 204—105 R **20 Claims**



1. A method of extracting technetium from radiocontaminated metal, comprising the steps of:

dissolving metal contaminated with radioactive technetium in an aqueous solution to produce a solution containing pertechnetate ions and metal ions;

reducing the pertechnetate ions to a technetium oxide precipitate; and

cathodically depositing metal from the solution.

5,183,542

APPARATUS AND METHOD FOR SEPARATING ZIRCONIUM ISOTOPES USING BALANCED ION ELECTROMIGRATION

John F. Jackovitz, Monroeville Boro; Richard P. Kunkle, Irwin, and Steven H. Peterson, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

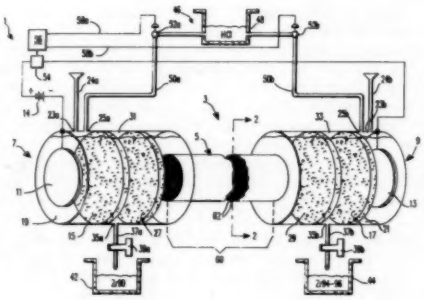
Filed Jan. 5, 1990, Ser. No. 461,578

Int. Cl.[5] B01D *57/02, 61/42*

U.S. Cl. 204—180.1 **18 Claims**

1. A method for separating zirconium isotopes by balanced ion migration in a counterflowing electrolyte solution, comprising the steps of:

introducing ions of different isotopes of zirconium into an electrolyte solution that includes non-zirconium ions, and



applying a voltage across said electrolyte solution with an anode and a cathode of between about 2 and 50 volts to create a flow of zirconium ions toward said cathode, and to create a counterflow of said non-zirconium ions toward said anode that reduces the net transport of zirconium ions across said anode and cathode to zero,

thereby causing the lighter weight isotopes of zirconium to migrate through said electrolyte solution toward the cathode while the heavier weight zirconium isotopes migrate through said electrolyte solution toward the anode.

5,183,543

POLYANILINES, PROCESS FOR THE PREPARATION THEREOF AND CELLS USING THEM

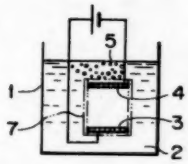
Shinichi Toyosawa, Tokorozawa; Tadashi Nakajima, Tokyo; Kinya Suzuki, Kodaira; Takahiro Kawagoe, Tokorozawa; Tadaaki Miyazaki, Higashiyamato; Takashi Kitamura, Hachioji; Tadashi Fuse, Kodaira; Masao Ogawa, Kawagoe; Yoshitomo Masuda; Hideharu Daifuku, both of Kodaira, and Ryota Fujio, Akigawa, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 15, 1986, Ser. No. 863,527

Claims priority, application Japan, May 15, 1985, 60-103391; May 15, 1985, 60-103392; May 15, 1985, 60-103393; Sep. 12, 1985, 60-202223; Oct. 1, 1985, 60-218883; Dec. 24, 1985, 60-296443; Jan. 29, 1986, 61-17162; Feb. 27, 1986, 61-43337

Int. Cl.[5] C25B *11/04, 9/00*

U.S. Cl. 204—242 22 Claims



1. A polyaniline film having a thickness of 0.3 to 5 mm and a density of 0.4 to 1.1 g/cm^3.

5,183,544

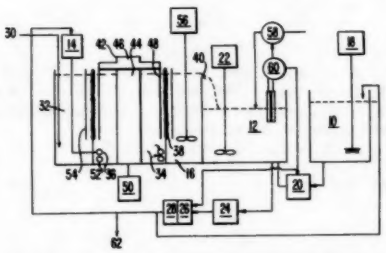
APPARATUS FOR ELECTROWINNING OF METAL FROM A WASTE METAL MATERIAL

Joseph R. Weber, and Ronald E. Bilak, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1991, Ser. No. 635,313

Int. Cl.[5] C25C *7/00*

U.S. Cl. 204—252 9 Claims



1. An apparatus for electrowinning a metal from a waste metal material, comprising:

(a) a vessel including means for mixing said waste metal material with an electrolyte to form a suspension;

(b) an electrolytic cell in fluid connection with said vessel, said electrolytic cell comprising:

(i) a cathodic compartment having a rotating cathode;

(ii) an anodic compartment adjacent to said cathodic compartment; and

(iii) a means for separating disposed between said cathodic and anodic compartment;

(c) means for moving a flow of said suspension from said vessel to said electrolytic cell; and

(d) a filter means located between said vessel and said electrolytic cell.

5,183,545

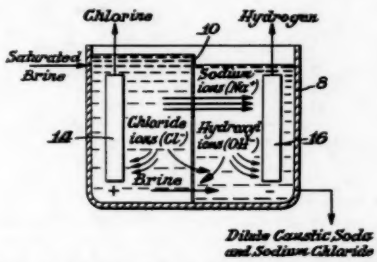
ELECTROLYTIC CELL WITH COMPOSITE, POROUS DIAPHRAGM

Phillip A. Branca, 132 Country Flower Rd., Newark, Del. 19711; Daniel E. Hubis, 227 Fair Hill Dr., Elkton, Md. 21921; Robert S. Mallouk, Box 332, R.D. #1, Chadds Ford, Pa. 19317, and Randal L. Perry, 1006 Timberwyck Rd., Wilmington, Del. 19810

Division of Ser. No. 511,110, Apr. 19, 1990, Pat. No. 5,094,895, which is a continuation-in-part of Ser. No. 344,707, Apr. 28, 1989, abandoned. This application Nov. 15, 1991, Ser. No. 792,665

Int. Cl.[5] C25C *13/02, 13/08, 9/00*

U.S. Cl. 204—252 14 Claims



1. In an electrolytic cell containing anode and cathode compartments separated by a diaphragm, an improved diaphragm is provided comprising a multilayer, porous composite diaphragm of multiple layers of porous, expanded polytetrafluoroethylene bonded together, said composite diaphragm having at least a portion of its exterior surfaces and at least a portion of its interior pore surfaces coated with a perfluoro ion exchange resin.

5,183,546

OPTIMIZED MULTIPOROUS CARBON BED FOR ELECTROCHEMICAL FILTERS

Yoram Oren; Haim Cohen, both of Beer-Sheva, and Abraham Soffer, Arad, all of Israel, assignors to State of Israel, Israel Atomic Energy Commission, Beer-Sheva, Israel

Continuation of Ser. No. 464,723, Jan. 16, 1990, abandoned, which is a continuation of Ser. No. 199,176, May 26, 1988, abandoned. This application Oct. 2, 1990, Ser. No. 593,387

Claims priority, application Israel, May 29, 1987, 82706

Int. Cl.[5] B01D *39/00*

U.S. Cl. 204—290 R 4 Claims

1. A hydrophilic electrochemical filter matrix, consisting of: carbon fibers in the 2 μ to 30 μ fiber diameter range; and, carbon or graphite particles in the 100 Å to 5,000 Å particle size range attached to the surface of said carbon fibers, such attachment of said particles resulting in an increase of the surface area of the filter from the range of abut 1 m^2/g to about 10 m^2/g, wherein the filter is characterized by a high electrical conductivity due to the carbon-particles to carbon fiber bond, and by a substantially free pathway of liquids flowing through the filter matrix.

5,183,547

SPUTTERING APPARATUS AND SYSTEM FOR SPUTTERING EMPLOYING SAME

Jiro Ikeda, Shizuoka, Japan, assignor to Sony Corporstion, Japan

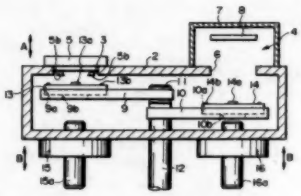
PCT No. PCT/JP90/01170, § 371 Date Apr. 19, 1991, § 102(e) Date Apr. 19, 1991, PCT Pub. No. WO91/04352, PCT Pub. Date Apr. 4, 1991

PCT Filed Sep. 12, 1990, Ser. No. 684,919

Claims priority, application Japan, Sep. 13, 1989, 1-237493; Mar. 30, 1990, 2-83794

Int. Cl.[5] C23C *14/56*

U.S. Cl. 204—298.25 **8 Claims**



1. A sputtering apparatus comprising:

a vacuum chamber having an opening for entrance and exit of a workpiece to be processed by sputtering and a processing section including a sputtering station,

a first rotary arm provided in said vacuum chamber and including a first rest on the free end of the first rotary arm, said first rest being adapted for supporting the workpiece, and an additional rotary arm provided at a predetermined distance apart from the first rotary arm in the rotational direction in the vacuum chamber, said additional rotary arm having a second rest on the free end of the additional rotary arm;

transfer means for transferring said workpiece between said opening and said processing section by the rotational movement of said first and said additional rotary arms while the opening is closed by either said first or said second rest;

first lift means for raising or lowering either said first or said second rest in said opening and second lift means for raising or lowering said first or second rest in said sputtering station; and

means for rotating said first rotary arm and said additional rotary arm so that, when one of the first rotary arm and the additional rotary arm is at said opening in said vacuum chamber, the other of the first rotary arm and the additional rotary arm is transferring said workpiece to the processing station.

5,183,548

SYSTEM AND METHOD FOR CONTINUOUS SEPARATION OF ISOTOPES

Thomas S. Snyder, Oakmont; John F. Jackovitz, Monroeville Boro, and Harry M. Ferrari, Fox Chapel, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 512,238, Apr. 20, 1990, Pat. No. 5,024,749. This application Apr. 9, 1991, Ser. No. 682,839

The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.

Int. Cl.[5] B01D *61/42*

U.S. Cl. 204—299 R **14 Claims**

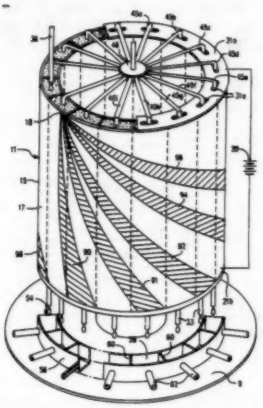
1. An isotopic separation system for continuously separating the isotopes present in a sample containing a mixture of isotopes of a chemical element in ionic form, said system comprising:

(a) rotatable annulus means having a feed end spaced axially from a discharge end for holding a plurality of circumferentially spaced separation cell means packed with a separation medium for separating said isotopes, wherein each of said separation cell means extends axially from said feed end to said discharge end;

(b) an isotope-containing sample feed source having an outlet means for introducing said sample into each of said separation cell means;

(c) an eluant source having a plurality of outlet means, wherein each said outlet means corresponds to a separation cell means, for introducing eluant into each said separation cell means;

(d) a pair of electrode means for applying an electric potential axially along said annulus means and each of said separation cell means while said annulus means is rotating, thereby causing the separation of lighter isotopes from heavier isotopes in said sample and the enrichment of said eluant with said isotopes; and



(e) drain assembly means at the discharge end of said annulus means for continuously collecting eluant enriched with one of said isotopes, including discharge outlet means associated with each said separation cell means for withdrawing isotopically enriched eluant from each said separation cell means.

5,183,549

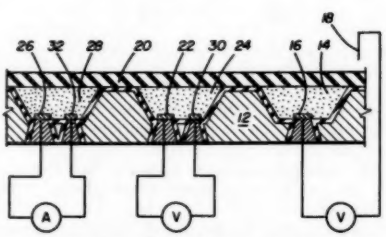
MULTI-ANALYTE SENSING ELECTROLYTIC CELL

Jose P. Joseph, Menlo Park, and Marc J. Madou, Palo Alto, both of Calif., assignors to Commtech International Management Corporation, Menlo Park, Calif.

Filed Jan. 26, 1990, Ser. No. 470,954

Int. Cl.[5] G01N *27/404, 27/414*

U.S. Cl. 204—415 **20 Claims**



1. A multi-analyte electrolytic sensor for determining the concentrations of an ionic species and of at least one vaporous species, both dissolved in a liquid, comprising:

a substrate having an ionic species sensing area and a vaporous species sensing area;

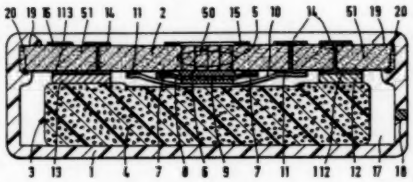
a first electrolyte on said ionic species sensing area;
a second electrolyte on said vaporous species sensing area;
a first sensing electrode in contact with the first electrolyte;
a second electrode in contact with the second electrolyte, said second electrode and said second electrolyte being isolated from said first sensing electrode and first electrolyte; and
a unitary membrane covering both of said sensing areas and both of said electrolytes, said membrane being permeable to said vaporous species, impermeable to said liquid and having dispersed therein an ionophore which senses said ionic species via selective transfer into said membrane of a quantity of said ionic species determined by the concentration of said ionic species in said liquid.

5,183,550

MEASURING CELL FOR ELECTROCHEMICALLY DETECTING A GAS

Hans Mattiessen, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 541,942
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1989, 3921528
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] G01N *27/404*
U.S. Cl. 204—415 **3 Claims**



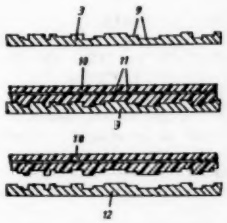
1. A measuring cell for electrochemically detecting a gas sample, the measuring cell comprising:
a housing having an opening directed toward the gas sample to be detected and defining an electrolyte chamber;
an electrolyte contained in said chamber;
a measuring electrode and an counter electrode disposed in said chamber so as to be in spaced relationship to each other;
a diffusion membrane interposed between aid opening and said electrolyte and being permeable to the gas sample;
said diffusion membrane being impermeable to said electrolyte and having a lower surface facing said electrolyte;
said measuring electrode being configured as a measuring electrode layer applied to said lower surface of said diffusion membrane;
said diffusion membrane having an upper surface facing toward the gas sample;
a protective disc interposed between said opening and said upper surface of said diffusion membrane;
said protective disc having a first component region permeable to the gas sample and a second component region impermeable to the gas sample and to said electrolyte;
said first component region having an upper surface area directed toward the gas sample and a lower surface area facing toward said electrolyte;
said first component region including a plurality of capillary passages formed in said protective disc and extending between said upper and lower surface areas of said first component region;
said second component region having a lower surface area facing toward said electrolyte and said counter electrode being configured as a counter electrode layer applied to said lower surface area of said second component region;
said counter electrode layer being electrically isolated from said measuring electrode and being in permanent electrical contact with said electrolyte;
said measuring electrode layer and said diffusion membrane being applied to said lower surface area of said first component region of said protective disc so as to communicate with said capillary passages;
said protective disc being made of thermally-conductive electrically-insulating material;
said capillary passages being dimensioned to determined the diffusion of the gas sample;
said second component region having an upper surface area facing the gas sample; and,
the measuring cell further comprising working contact pads formed on said upper surface area of said second component region and being connected through said protective disc to respective ones of said electrodes.

5,183,551

METHOD FOR MAKING A CONTINOUS METAL BAND HAVING SURFACE IMPRESSIONS

Wilfried Werthmann, Krefeld-Fischeln, Netherlands, assignor to Standex International GmbH, Krefeld, Fed. Rep. of Germany

PCT No. PCT/EP89/00176, § 371 Date May 16, 1990, § 102(e) Date May 16, 1990, PCT Pub. No. WO90/09865, PCT Pub. Date Sep. 7, 1990
PCT Filed Feb. 22, 1989, Ser. No. 466,442
Int. Cl.[5] C25D *1/10*; **B23P** *15/24*
U.S. Cl. 205—70 **7 Claims**



1. A method for making an endless metallic band having a pattern for the continuous production of laminated boards, comprising the steps of providing a first endless band having the pattern on the surface thereof casting an endless, plastic band over the surface of the first endless band having the pattern so that the plastic band has a corresponding pattern on a surface thereof, rendering the surface of the plastic band which carries the pattern electrically conductive, electrolytically depositing a metal layer over the pattern on the surface of the plastic band to thereby form a working copy of the plastic band, and removing the plastic band from the working copy so that the working copy constitutes a duplicate of the first endless band.

5,183,552

PROCESS FOR METALLIZATION OF A NONCONDUCTOR SURFACE, ESPECIALLY ON A CIRCUIT BOARD HAVING PREEXISTING COPPER SURFACES

Burkhard Bressel; Heinrich Meyer; Walter Meyer, and Klaus Gedrat, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 583,961, Sep. 14, 1990. This application Feb. 14, 1991, Ser. No. 655,789

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3931003; Dec. 5, 1989, 3940565

Int. Cl.[5] C25D *5/54, 11/34*

U.S. Cl. 205—158 23 Claims

1. A process for directly metallizing a nonconductor surface on a circuit board also having copper surfaces, comprising the steps of reacting the nonconductor surface on the circuit board with permanganate to form manganese dioxide adsorbed on the nonconductor surface; depositing an adherent, insoluble polymer product the manganese dioxide adsorbed on the nonconductor surface from an aqueous solution of a weak acid having an acid dissociation constant, for loss of a proton in aqueous solution, between 0.1 and 0.01, a monomer selected from the group consisting of pyrrole and pyrrole derivatives, and at least one oligomer selected from the group consisting of oligomers of said pyrrole derivatives and said pyrrole; by contacting the aqueous solution with the manganese dioxide adsorbed on the nonconductor surface, the polymer product having an electrical conductance which is sufficient so that a metal can be directly electroplated on the polymer product, and then directly electroplating the metal on the polymer product, wherein any oxide film formed on said copper surfaces during said reacting with said permanganate is removed by said weak acid in said aqueous solution during said contacting to prevent formation of another polymer layer on said copper surfaces.

5,183,553

METHOD OF FORMING A HIGH TEMPERATURE RESISTANT COPPER COATING ON AN INORGANIC DIELECTRIC

Detlef Tenbrink, Paderborn; Martin Bock, Berlin; Kurt Heymann, Berlin, and Martin Rimkus, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jul. 13, 1989, Ser. No. 379,809

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1988, 3824249

Int. Cl.[5] C25D *5/54, 5/00*

U.S. Cl. 205—162 6 Claims

1. A method of forming a high temperature resistant copper coating on an inorganic dielectric selected from the group consisting of ceramic and enamel substrates, comprising the steps of:

a. chemically depositing a copper layer having a thickness of at least 3 μm on said inorganic dielectric;

b. heating the copper layer at a temperature of from 200° to 450° C.;

c. mechanically treating the copper layer with brush and polishing means to consolidate an upper surface thereof;

d. galvanically depositing an additional copper layer having a thickness of at least 3 μm.

5,183,554

METHOD FOR CONTROLLING FOULING DEPOSIT FORMATION IN A LIQUID HYDROCARBONACEOUS MEDIUM

David R. Forester, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

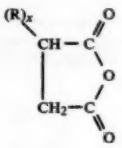
Filed Sep. 9, 1991, Ser. No. 756,813

Int. Cl.[5] C10G *9/12, 9/16*

U.S. Cl. 208—48 AA 5 Claims

1. A method of inhibiting fouling deposit formation in a liquid hydrocarbonaceous medium during heat treatment processing thereof, at a temperature of from about 200° C.-550° C., wherein, in the absence of such antifouling treatment, fouling deposits are normally formed as a separate phase within said liquid hydrocarbonaceous medium impeding process throughput and thermal transfer, said method comprising adding to said heat treated liquid hydrocarbonaceous medium, an antifouling amount of from about 0.5-10,000 parts by weight based upon one million parts of said hydrocarbonaceous medium of a reaction product of

(a) polyalkenylsuccinic acid, C_1–C_6 alkyl mono- or diester of said acid or polyalkenylsuccinic anhydride having the formula



(I)

wherein R is an aliphatic alkenyl or alkyl moiety having between 50 and 200 carbon atoms,

(b) a secondary aromatic amine having the formula

(II)

wherein R_2 and R_3 are independently chosen from aryl and C_1–C_{18} alkaryl; and

(c) a hindered alcohol having the formula

(III)

wherein R_4, R_5 and R_6 are independently chosen from H, CH_2OH, and OH; and wherein R_7 is CH_2OH, CH_2OH substituted lower alkyl (C_1–C_6), OH substituted lower alkyl (C_1–C_6), CH_2OH and OH substituted lower alkyl (C_1–C_6), CH_2—O—R_8 or —O—R_8 wherein R_8 is lower alkyl (C_1–C_6), OH substituted lower alkyl (C_1–C_6) or CH_2OH substituted lower alkyl (C_1–C_6).

5,183,555

METHOD FOR CONTROLLING FOULING DEPOSIT FORMATION IN A LIQUID HYDROCARBONACEOUS MEDIUM

David R. Forester, Conroe, and Paul V. Roling, Spring, both of Tex., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 29, 1991, Ser. No. 751,947

Int. Cl.[5] C10G *9/12, 9/16*

U.S. Cl. 208—48 AA 8 Claims

1. A method for inhibiting fouling deposit formation in a liquid hydrocarbonaceous medium during heat treatment processing thereof at temperatures from 200° C. to 550° C., wherein in the absence of such antifouling treatment, fouling deposits are normally formed as a separate phase within said

liquid hydrocarbonaceous medium thereby impeding process throughput and thermal transfer, said method comprising adding to said liquid hydrocarbonaceous medium about 0.5 parts to about 1,000 parts per million parts hydrocarbonaceous medium of a glyoxylic acid/alkylphenol derivative of a polyalkenylsuccinimide containing an aliphatic alkyl group or alkenyl group with from about 50 to about 200 carbon atoms.

5,183,556

PRODUCTION OF DIESEL FUEL BY HYDROGENATION OF A DIESEL FEED

James W. Reilly, Westfield, and Gary Hamilton, Shrewsbury, both of N.J., assignors to ABB Lummus Crest Inc., Bloomfield, N.J.

Filed Mar. 13, 1991, Ser. No. 668,869
Int. Cl.[5] C10G *45/00*
U.S. Cl. 208—57 **14 Claims**

1. A process for producing diesel fuel by hydrogenation of a hydrocarbon feed, comprising:

passing a hydrocarbon feed in cocurrent contact with a hydrogen gas through a first hydrogenation zone in the presence of a hydrogenation catalyst, thereby at least partially hydrogenating said feed, said feed having an about 10% by volume boiling point of from about 300° F. to about 500° F. and an about 90% by volume boiling point of at least about 500° F. and no greater than 750° F.

removing from said first hydrogenation zone a gas phase effluent comprising hydrogen and vaporized liquid materials, and a partially hydrogenated liquid hydrocarbon effluent;

further hydrogenating the liquid hydrocarbon effluent in a second hydrogenation zone by passing a hydrogen-rich gas into the second hydrogenation zone countercurrently to the liquid hydrocarbon effluent in the presence of a hydrogenation catalyst; and

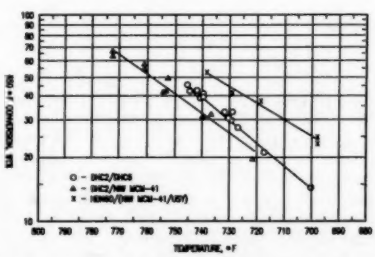
recovering from said second hydrogenation zone a gas phase effluent comprising hydrogen and vaporized liquid material and a liquid phase effluent comprising diesel fuel.

5,183,557

HYDROCRACKING PROCESS USING ULTRA-LARGE PORE SIZE CATALYSTS

Thomas F. Degnan, Jr., Moorestown; Kathleen M. Keville, West Deptford; Michael E. Landis, Woodbury; David O. Marler, Deptford, and Dominick N. Mazzone, Wenonah, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 24, 1991, Ser. No. 734,983
Int. Cl.[5] C10G *47/02, 47/04, 47/20*
U.S. Cl. 208—111 **22 Claims**



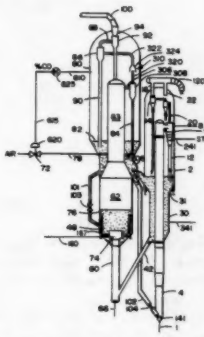
1. A hydrocracking process which comprises contacting a hydrocarbon feed in the presence of hydrogen with a bifunctional hydrocracking catalyst having acidic functionality and hydrogenation-dehydrogenation functionality, and comprising a metal hydrogenation component, a zeolite component and an inorganic, porous crystalline phase material having pores with diameters of at least about 13 Angstrom Units and exhibiting, after calcination, an X-ray diffraction pattern with at least one peak at a d-spacing greater than about 18Å.

5,183,558

HEAVY OIL CATALYTIC CRACKING PROCESS AND APPARATUS

Hartley Owen, Belle Mead, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 31, 1990, Ser. No. 636,463
Int. Cl.[5] C10G *11/00*
U.S. Cl. 208—113 **11 Claims**



1. A fluidized catalytic cracking process wherein a heavy hydrocarbon feed comprising hydrocarbons having a boiling point above about 650° F. is catalytically cracked to lighter products comprising the steps of:

a. catalytically cracking said feed in a catalytic cracking zone operating at catalytic cracking conditions by contacting said feed with a source of hot regenerated catalyst to produce a cracking zone effluent mixture comprising cracked products and spent cracking catalyst containing strippable hydrocarbons and coke comprising carbon and hydrogen, and;

b. separating said cracking zone effluent mixture into a cracked product rich vapor phase and a solids rich phase comprising said spend catalyst and strippable hydrocarbons;

c. stripping said catalyst mixture with a stripping gas to remove strippable compounds from spent catalyst and produce a stripped catalyst;

d. regenerating said stripped catalyst by contacting said catalyst with recycled regenerated catalyst and oxygen or an oxygen containing gas in a dense phase fluidized bed coke combustor comprising a fluidized bed with inlets for oxygen containing gas, for recycled regenerated catalyst and for stripped catalyst, and an overhead outlet for at least partially regenerated catalyst and flue gas comprising CO2 and water vapor formed by combustion of carbon and hydrocarbon in said coke, wherein said coke combustor is essentially free of catalyst/gas separation means and said coke combustor is below, and in open fluid communication with, a superimposed, dilute phase transport riser having an opening at the base connective with said coke combustor which transports at least partially regenerated catalyst and flue gas from the base of the riser to an outlet at an upper portion thereof;

e. discharging and immediately separating in a cyclone separation means catalyst and flue gas comprising water vapor discharged as a dilute phase from said dilute phase transport riser outlet into a catalyst rich phase and a water vapor rich flue gas phase having a steam partial pressure of 3.5 to 7 psia and comprising over 90% of the water formed by combustion of hydrogen in said coke and dis-

charging said separated catalyst down from said cyclones to form a second fluidized bed of catalyst maintained as a fluidized bed about said transport riser, and having a dilute phase region above said second fluidized bed having a steam partial pressure less than 20% of the steam partial pressure of the water vapor rich flue gas exiting the dilute phase transport riser, and discharging said separated water vapor rich flue gas phase into a flue gas removal means which is isolated from and closed to said second fluidized bed and the dilute phase vapor region above said second fluidized bed and adapted to remove flue gas from said regeneration means; and

f. recycling to the catalytic cracking process and to the coke combustor hot regenerated catalyst from said second fluidized bed.

5,183,559

RARE EARTH EXCHANGED LAYERED SILICATE CATALYSTS

Garry W. Kirker, Washington Township, Bergen County, N.J.; Thomas F. Degnan, Jr., Yardley, Pa.; Albin Huss, Jr., Chadds Ford, Pa., and Michael E. Landis, Woodbury, N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Division of Ser. No. 396,711, Aug. 22, 1989, abandoned. This application Sep. 13, 1991, Ser. No. 759,795

Int. Cl.[5] C10G *11/00, 11/02*

U.S. Cl. 208—119 **10 Claims**

1. A process for cracking hydrocarbons over a catalyst, wherein said catalyst is regenerated, said process comprising the steps of:

(i) contacting said hydrocarbons with said catalyst under conditions sufficient to crack said hydrocarbons and to form a deposit of coke on said catalyst;

(ii) stripping residual hydrocarbons from the coked catalyst of step (i) with steam;

(iii) removing deposited coke from the stripped catalyst of step (ii) by subjecting said catalyst to sufficient oxidizing condition, whereby coke is oxidized; and

(iv) contacting the regenerated catalyst of step (iii) with more hydrocarbons under conditions sufficient to crack these hydrocarbons;

wherein said catalyst comprises a layered silicate comprising interspathic polymeric silica, said layered silicate lacking the octahedral sheets of clays, said layered silicate further comprising rare earth metal cations.

5,183,560

TREATMENT OF OILS USING CHOLINE BASE

Glenn L. Roof, Sugar Land, and Lawrence N. Kremer, The Woodlands, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 9, 1991, Ser. No. 756,446

Int. Cl.[5] C10G *29/20*

U.S. Cl. 208—236 **6 Claims**

1. A method of decreasing hydrogen sulfide atmosphere over sour heavy fuel oils comprising treating such fuel oil with an amount of choline base effective to decrease said atmospheric hydrogen sulfide over said fuel oil at a temperature above the decomposition temperature of choline base.

5,183,561

DEMETALLATION OF HYDROCARBON FEEDSTOCKS WITH A SYNTHETIC MESOPOROUS CRYSTALLINE MATERIAL

Charles T. Kresge, West Chester, Pa.; Michael E. Leonowicz, Medford Lakes; Wieslaw J. Roth, Sewell, both of N.J.; James C. Vartuli, West Chester, Pa.; Kathleen M. Keville, Woodbury, N.J.; Stuart S. Shih, Cherry Hill, N.J.; Thomas F. Degnan, Moorestown, N.J.; Francis G. Dwyer, West Chester, Pa., and Michael E. Landis, Woodbury, N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 625,245, Dec. 10, 1990, Pat. No. 5,098,684, which is a continuation-in-part of Ser. No. 470,008, Jan. 25, 1990, Pat. No. 5,102,643. This application Jul. 24, 1991, Ser. No. 734,992

Int. Cl.[5] C10G *45/04, 45/02*

U.S. Cl. 208—251 R **20 Claims**

1. A process for demetallizing a hydrocarbon feedstock, said process comprising contacting said hydrocarbon feedstock with a catalyst under sufficient demetallation conditions, said catalyst comprising at least one hydrogenation metal and an inorganic, porous crystalline phase material having, after calcination, a hexagonal arrangement of uniformly-sized pores having diameters of at least about 13 Angstrom Units and exhibiting a hexagonal electron diffraction pattern that can be indexed with a d_{100} value greater than about 18 Angstrom units.

5,183,562

APPARATUS FOR COAGULATING TREATMENT

Toshio Totoki; Hirotake Shigemi, and Yoshio Yasukawa, all of Shinjuku, Japan, assignors to Kurita Water Industries Ltd., Tokyo, Japan

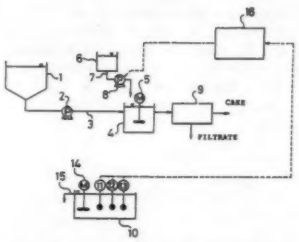
PCT No. PCT/JP90/00197, § 371 Date Aug. 6, 1991, § 102(e) Date Aug. 6, 1991, PCT Pub. No. WO90/09835, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 20, 1990, Ser. No. 743,347

Claims priority, application Japan, Feb. 23, 1989, 1-44290; Nov. 10, 1989, 1-293358

Int. Cl.[5] B01D *21/30;* **G01N** *25/18*

U.S. Cl. 210—85 **16 Claims**



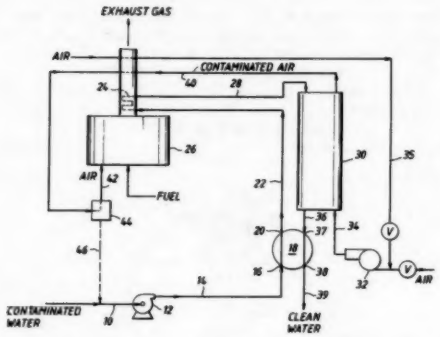
2. A coagulating apparatus for effecting coagulation in a liquid by addition of a coagulant, comprising first guiding means for receiving a liquid to be subjected to a coagulating treatment and guiding the received liquid to at least one part at which the coagulant is added, adding means for adding the coagulant to the liquid in a variable amount at the part for addition of the coagulant, solid-liquid separating means for separating the liquid with the coagulant into a liquid content and a solid content, second guiding means situated between the adding means and the separating means to guide the liquid to the separating means, a heat transfer detecting meter disposed so as to contact the liquid content separated by the solid-liquid separating means, and control means for controlling an amount of addition of the coagulant through the adding means so that a value of detection of the heat transfer detecting meter is minimized to be within a target range.

5,183,563

SYSTEM FOR REMOVAL AND DISPOSAL OF MINOR AMOUNTS OF ORGANICS FROM CONTAMINATED WATER

John B. Rodden, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 18, 1991, Ser. No. 686,955
Int. Cl.[5] C02F *1/20*
U.S. Cl. 210—180 4 Claims



1. A system for reducing the level of minor amounts of volatile organic contaminants from water containing such contaminants, which includes:

A) water supply means for supplying water to said system and capable of being connected to a supply of water contaminated with minor amounts of volatile organic compounds;

B) first heat exchange means having a first inlet connected to said water supply means, having a first internal volume for heating said contaminated water by indirect heat exchange with hot product water, said first internal volume communicating with a first outlet, and also having a second inlet, said second inlet communicating with a second internal volume in heat exchange relation with said first internal volume, and a second outlet communicating with said second internal volume;

C) second heat exchange means disposed in heat exchange relation with a furnace, said second heat exchange means having an inlet connected to the first outlet of said first heat exchange means, and having an outlet;

D) a upright vessel containing packing or trays for contacting contaminated water with a stripping gas, said upright having a water inlet and a gas outlet each disposed in the upper part of said upright vessel and having a water outlet and a gas inlet disposed in the lower part of said upright vessel;

E) a conduit for vessel feed water connecting the outlet of said second heat exchange means to the water inlet of said upright vessel;

F) a conduit for vessel product water connecting the outlet from said upright vessel with the second inlet of said first heat exchange means;

G) a conduit connected to the second outlet of said first heat exchange means for passing water having reduced level of volatile organic contaminants from the system;

H) means for supplying gas connected to the gas inlet of said upright vessel for stripping volatile organic contaminants from water in said upright vessel; and

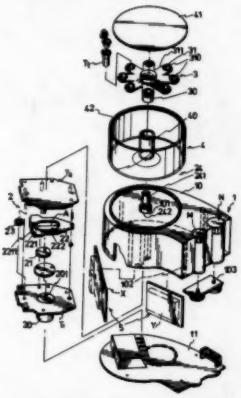
I) a conduit for vessel product gas connecting the gas outlet of the vessel to the inlet of said furnace.

5,183,564

STIRRING DEVICE FOR FACILITATING DIALYSIS

Chin-Chen Hong, 8th Fl., No. 62-5, Hsi-Ning N. Rd., Taipei, Taiwan

Filed Dec. 5, 1991, Ser. No. 802,533
Int. Cl.[5] B01D *61/28*
U.S. Cl. 210—232 8 Claims



1. A stirring device for facilitating dialysis, comprising:

a housing;

a mechanical driving assembly including: an axle having a first end portion extending out of said housing and a second end portion extending into said housing; a sprocket connected to said second end portion of said axle; a motor unit provided inside said housing and having a driving shaft; a circular cam plate mounted eccentrically on and being rotatably driven by said driving shaft; and a cam follower having a curved edge provided with gear teeth which mesh with said sprocket, said cam follower being formed with a cam groove to receive said cam plate, and rotation of said cam plate inside said cam groove causing reciprocating left and right movement of said cam follower to bring about reciprocating clockwise and counterclockwise rotation of said sprocket and said axle;

a dialysate chamber formed as a hollow cylinder that confines a receiving space to receive a volume of solvent, said dialysate chamber being provided on top of said housing and being formed with an axially extending tubular sleeve; and

a sample tube holder provided inside said dialysate chamber and having a shaft portion that extends into said tubular sleeve of said dialysate chamber, said shaft portion being connected to said first end portion of said axle and having an upper end provided with a tube support portion that is formed with a plurality of angularly spaced tube receiving holes for holding analytical test tubes.

5,183,565

APPARATUS AND PROCESS FOR TREATING WATER

Heinz Zimmermann, Am Park 22, D-4156 Willich, and Hans J. M. Manteuffel, Am alten Broich 213a, D-4018 Langenfeld, both of Fed. Rep. of Germany

Filed Jun. 18, 1991, Ser. No. 717,017
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1990, 4019580
Int. Cl.[5] B01D *24/46*
U.S. Cl. 210—269 6 Claims

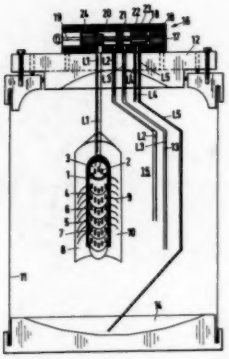
6. An apparatus for purifying a liquid, said apparatus comprising:

a container extending along an axis and formed with an inner peripheral wall;

an anode mounted in said container and spaced radially inwardly from said inner wall, said anode being a spiral;

a helical cathode mounted in said container and spaced radially outwardly from said anode, said cathode and said inner wall forming an outer chamber therebetween;

a layer of ion exchange material mounted between said anode and cathode in said container and radially spaced from said anode and cathode, said cathode and said layer forming an inner chamber therebetween;



means for filling said container with a liquid, said outer chamber being provided with a liquid-fill space and said inner chamber being provided with a treatment free liquid-filled space, each of said outer and inner chambers being axially open at respective opposite ends, so that said treatment space and said liquid-fill space being in a flow communication for providing a liquid circulation; and

means connected with said cathode and anode for generating a magnetic field across said spiral anode and said helical cathode, said field being magnetic direct or alternating field.

5,183,566

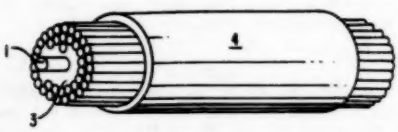
HOLLOW FIBER MODULE BUILT UP FROM CONCENTRIC CYLINDERS OF HOLLOW FIBERS

Charles F. Darnell, Baton Rouge, La., and Mahmoud M. Hafez, Bright's Grove, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 430,225, Nov. 1, 1989, abandoned. This application Jul. 18, 1991, Ser. No. 732,256

Int. Cl.[5] B01D *69/08*

U.S. Cl. 210—321.8 **9 Claims**



1. A hollow fiber module made by the method comprising fabricating a first, generally cylindrical central sub-assembly of hollow fibers, the ends of which sub-assembly are potted said potting forming circular collars at the ends of the first central sub-assembly, and a series of additional cylindrical sub-assemblies generally equal in length to the first central sub-assembly and to each other, each such sub-assembly being of increasing diameter and fitting around a next smaller cylindrical sub-assembly in the series and inside a next larger cylindrical sub-assembly in the series, each such sub-assembly comprising hollow fibers potted at the ends, said potting forming circular collars of potting, wherein the cylindrical sub-assemblies are fitted concentrically into each other according to size and around the first central sub-assembly, the entire array of concentrically assembled sub-assemblies being glued in the spaces between the circular collars of potting at the ends of each concentrically fitted cylindrical sub-assembly and the central sub-assembly to produce a complete hollow fiber module.

5,183,567

APPARATUS FOR FILTERING AND SEPARATING FLOWING MEDIUM

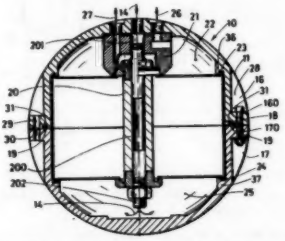
Jürgen Mohn, Reinbek, and Wilhelm Heine, Hamburg, both of Fed. Rep. of Germany, assignors to DT Membranfilter Vertriebs GmbH, Hamburg, Fed. Rep. of Germany

Filed Jan. 6, 1992, Ser. No. 817,887

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1991, 4130481

Int. Cl.[5] B01D *63/08, 69/06*

U.S. Cl. 210—321.75 **13 Claims**



1. An apparatus comprising: means for filtering and separating flowing medium by reverse osmosis, ultrafiltration, and microfiltration, including,

a closed spherical housing in which is disposed an element stack comprised of disk-shaped spacers and respective filter elements between each two spacers, about which said flowing medium flows.

5,183,568

SELF-CLEANING STRAINER

Joseph E. Lescovich, Pittsburgh, Pa., assignor to G A Industries, Inc., Mars, Pa.

Filed Aug. 22, 1991, Ser. No. 748,659

Int. Cl.[5] B01D *33/067, 33/11*

U.S. Cl. 210—360.1 **17 Claims**

1. A self-cleaning strainer comprising:

a vertically disposed housing having an upstanding side wall, an open top and a bottom wall;

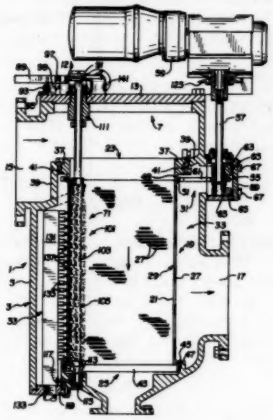
said housing having an inlet in the side wall for a liquid containing particulates, adjacent said open top, an outlet in the side wall adjacent said bottom wall for clean liquid, and a flush discharge opening in said bottom wall;

a cover plate sealingly closing the open top of said housing;

a rotatable strainer basket, having a cylindrical foraminous side wall with an inner surface and an open top and bottom, with openings through said cylindrical side wall for flow of liquid therethrough, disposed in said housing, spaced from said side wall of said housing and disposed below said inlet, such that liquid containing particulates entering said inlet passes into said strainer basket and outwardly through said openings to remove said particulates, and clean liquid is directed through said outlet;

means for rotating said strainer basket in said housing, said means for rotating being positioned out of the flow of liquid containing particulates, and disposed within said

housing between said cylindrical side wall of said strainer basket and said upstanding side wall of said housing; and



means for cleaning the inner surface of the cylindrical side wall of said strainer basket to remove particulates which are collected thereon.

5,183,569

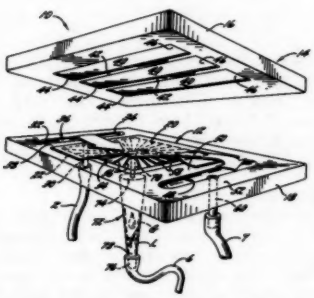
FILTRATION APPARATUS AND PROCESS

Andreas Kyriacou, Toronto, Canada, assignor to Paradigm Biotechnologies Partnership, Toronto, Canada

Filed Dec. 16, 1991, Ser. No. 808,442

Int. Cl.[5] B01D *61/20*

U.S. Cl. 210—636 **11 Claims**



2. A filtration process for collection of a filtrate from a bulk fluid, said process comprising passing a bulk fluid to be filtered, into a filtration apparatus containing a filtration medium, wherein said fluid enters said filtration apparatus from a direction countercurrent to filtrate flow through said filtration medium; thereafter, without said fluid having contacted a downstream surface of said filtration medium, passing said fluid over an upstream surface of said filtration medium and effecting filtration of said fluid in a cross-flow direction to provide a filtrate, and collecting unfiltered fluid from an upstream side of said filtration medium; directing said filtrate toward a drip-forming channel disposed downstream of said filtration medium, passing said filtrate through said drip-forming channel and thereafter collecting said filtrate, and preventing contamination of fluid on said upstream surface by any contaminants downstream of said filtration medium, by forming an air gap between said filtrate and said filtration medium.

5,183,570

PROCESS FOR PREPARING OSTEOGENESIS PROMOTING SUBSTANCE

Kohei Notoya, Settsu; Keiji Yoshida, Kawanishi, and Iwao Yamazaki, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 5, 1991, Ser. No. 755,007

Claims priority, application Japan, Sep. 6, 1990, 2-238424

Int. Cl.[5] B01D *61/14, 61/22*

U.S. Cl. 210—641 **8 Claims**

1. A process for preparing an osteogenesis promoting substance, by steps other than affinity chromatography, said steps comprising extracting a demineralized bone powder with a solution of chaotropic reagent, subjecting the extracted solution to ultrafiltration to collect a fraction containing substances ranging from 10,000 to 100,000 daltons as molecular weight, dialyzing the collected fraction and collecting the water-soluble fraction from the dialyzing liquid.

5,183,571

MULTILAYER MEMBRANE AND PROCESS OF MANUFACTURING THE SAME

Peter Hanel, Bad Vilbel; Harald Helmrich, Frankfurt, and Ulrich Sander, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 11, 1991, Ser. No. 653,653

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1990, 4004153

Int. Cl.[5] B01D *39/16, 61/36, 71/38*

U.S. Cl. 210—649 **13 Claims**

1. A multilayer membrane, comprising a carrier layer composed of fibers of a material selected from the group consisting of polyamide, polyvinylidene difluoride, polyester and glass; a porous supporting layer composed of a material selected from the group consisting of polysulfone, polyvinylidene difluoride, polyethersulfone, polyimide, polyvinyl alcohol, polyurethane, polyacrylonitrile and polyether imide; and a separating layer composed of polyvinyl alcohol, said separating layer being nonporous and having a structure having a high microcrystalline content with crystallites which exhibit in the X-ray diffraction pattern a reflection in a range of 1.2 to 1.5 degrees at diffraction angles H 2 O of 19.6 to 20°.

13. A method of separating liquid, vaporous and gaseous mixtures, comprising the steps of providing a multilayer membrane including a carrier layer composed of fibers of a material selected from the group consisting of polyamide, polyvinylidene difluoride, polyester and glass; a porous supporting layer composed of a material selected from the group consisting of polysulfone, polyvinylidene difluoride, polyethersulfone, polyimide, polyvinyl alcohol, polyurethane, polyacrylonitrile and polyether imide; a separating layer composed of polyvinyl alcohol, said separating layer being nonporous and having a structure having a high microcrystalline content with crystallites which exhibit in the X-ray diffraction pattern a reflection in a range of 1.2 to 1.5 degrees at diffraction angles H 2 θ of 19.6° to 20°; and using said membrane for separation of liquid, vaporous and gaseous mixtures.

5,183,572

CROSS-FLOW FILTRATION SYSTEM AND METHOD FOR FILTERING A SOLVENT-PARTICULATE WASTE STREAM

James A. Bean, Arlington, Mass., assignor to Curtis Manufacturing Company, Inc., Jaffrey, N.H.

Filed Aug. 23, 1991, Ser. No. 749,302

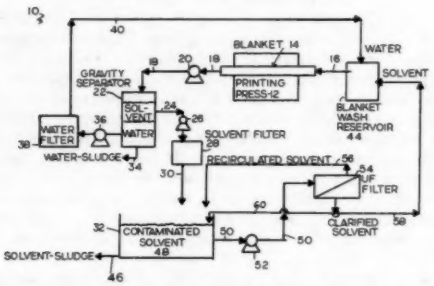
Int. Cl.[5] B01D *61/00*

U.S. Cl. 210—650 **18 Claims**

1. A method for the filtering of a solvent-particulate waste stream into a clarified solvent stream and a solvent-particulate stream, which method comprises:

a) directing a solvent-particulate waste stream into a processing container for treatment;
b) pumping under pressure the waste stream from the processing container through a filter for the removal of a filtrate portion of the waste stream as a clarified solvent stream and recirculating at least a portion of a concentrated waste stream back to the processing container;
c) maintaining the recirculating flow rate of the waste stream at less than about 0.05 gallons per minute per square foot (GPM/sqft) of filter surface area;
d) removing the clarified solvent stream from the filter;
e) adding continuously solvent-particulate waste stream to the processing container;
f) removing continuously a clarified solvent stream from the filter for reuse in the cleaning operation; and
g) disposing periodically of accumulated particulate-solvent sludge material in the processing container when a high level of particulate and a lower level of solvent remains in the processing container.

18. A method for the filtering and reuse of a water-solvent-particulate waste stream derived from the cleaning of a printing press ink blanket by a water-solvent stream, which method comprises:
a) washing a printing press blanket with a water-solvent stream to provide a water-solvent-particulate waste stream;
b) pumping the waste stream into a gravity separator means to provide for the gravity separator of the water and



solvent into a lower, water-particulate portion and an upper, solvent-particulate portion;
c) pumping the water-particulate portion from the gravity separator through a water filter and the filtered water recycled to a blanket wash reservoir for reuse in washing the printing press blanket;
d) pumping the solvent-particulate portion from the gravity separator through a solvent filter to provide a contaminated solvent stream;
e) introducing the contaminated solvent stream into a processing container;
f) pumping at a pressure of greater than about 25 psi the contaminated solvent stream from the processing container through a filter having a pore size of about 0.2 microns or less to provide a filtrate of a clarified solvent stream, while maintaining the flow rate of the contaminated solvent stream at less than about 0.05 gallons per minute per square foot of filter surface area;
g) recycling after each startup of the filter the filtrate portion of the filter to the processing container for a period of time until the filtrate portion is relatively clear in color and suitable for reuse;
h) removing the clarified solvent stream from the filter at a rate of less than about 3 gallons of flux per square foot of filter surface area per day;
i) adding contaminated solvent stream to the processing container;
j) recycling the clarified solvent stream from the filter to the blanket wash reservoir for reuse in the washing of the printing press blanket; and
k) disposing periodically accumulated particulate-solvent sludge material from the processing container
thereby providing for a closed loop recycling filtration method for a waste stream from a printing press blanket.

5,183,573

MULTIPURPOSE SCALE PREVENTER/REMOVER

Robert P. Kreh, Jessup, and Wayne L. Henry, Gaithersburg, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,527
Int. Cl.[5] C02F *5/12*
U.S. Cl. 210—697 **7 Claims**

1. A process for preventing or removing calcium and rust scale deposits from surfaces which are in contact with an aqueous system having a pH in the range 8 to 9 comprising adding to the aqueous system 3,5-bis(di-N,N-(carboxymethyl-)aminomethyl)-4-hydroxybenzenesulfonic acid in an amount effective to remove the scale and rust deposits.

5,183,574

METHOD OF DISPERSING IRON

Chih Ming Hwa, Palatine; John A. Kelly, Crystal Lake; Wun Ten Tai, Palos Hills; Lai-Duien G. Fan, Lake Zurich, all of Ill.; Robert P. Kreh, Jessup, Md., and Brian Greaves, Runcorn, England, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Nov. 18, 1991, Ser. No. 793,760
Int. Cl.[5] C02F *5/10*
U.S. Cl. 210—701 **6 Claims**

1. A method of dispersing iron in an aqueous system comprising adding to the system a copolymer of styrene sulfonic acid and methacrylic acid or its water soluble salt in an amount effective to disperse the iron contained therein wherein said copolymer has a molar ratio of styrene sulfonic acid: methacrylic acid from 5:95 to 95:5.

5,183,575

METHODS FOR THE FLOCCULATION OF COAL FINES AND INSOLUBLE METALS IN COAL MINE WATERS

Stephen R. Vasconcellos, Doylestown, Pa.; P. Douglas Boyce, Hurricane, W. Va., and Larry P. Smith, Yardley, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Aug. 29, 1991, Ser. No. 751,946
Int. Cl.[5] C02F *1/56*
U.S. Cl. 210—724 **10 Claims**

1. A method for flocculating coal fines and suspended insoluble metals in coal mine drainage waters having a pH of about 6 to 9 comprising adding to said coal mine drainage waters 1 part to 100 parts per million parts coal mine drainage waters a polymeric tannin-amine compound having a molecular weight of about 5 to about 10,000 daltons.

5,183,576

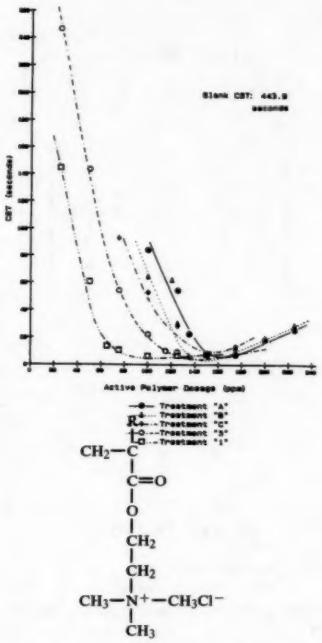
CATIONIC POLYMERS FOR SLUDGE DEWATERING

Michael R. Wood, Philadelphia; Keith A. Bair, Horsham; Fu Chen, Newtown, and Stephen R. Vasconcellos, Doylestown, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 533,962, Jun. 6, 1990, Pat. No. 5,100,561. This application Aug. 9, 1991, Ser. No. 742,829
The portion of the term of this patent subsequent to Mar. 31, 2009, has been disclaimed.
Int. Cl.[5] C02F *11/14*
U.S. Cl. 210—734 **10 Claims**

1. A method of dewatering aqueous sludge, wherein said sludge consists essentially of a mixture of primary and secondary sludge from a pharmaceutical plant and secondary sludge from a chemical plant comprising adding to said sludge an

effective amount for the purpose of a homopolymer comprising repeat unit moieties having the structure:



wherein R is hydrogen or methyl and having an intrinsic viscosity from about 1.0 dl/g to about 2.9 dl/g as measured in 1M sodium chloride at 30° C.

5,183,577

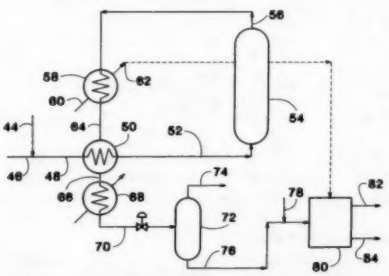
PROCESS FOR TREATMENT OF WASTEWATER CONTAINING INORGANIC AMMONIUM SALTS

Richard W. Lehmann, Wausau, Wis., assignor to Zimpro Passavant Environmental Systems, Inc., Rothschild, Wis.

Filed Jan. 6, 1992, Ser. No. 817,157

Int. Cl.[5] C02F *1/74, 11/08*

U.S. Cl. 210—761 **21 Claims**



1. A process for treating an aqueous wastewater containing ammonium compounds, said process comprising the steps of:

(a) preheating a liquid influent;

(b) introducing said preheated influent, an oxygen-containing gas and said wastewater into a reaction vessel for undergoing wet oxidation;

(c) withdrawing from said reaction vessel an oxidized effluent including a gas phase containing ammonia and carbon dioxide and a liquid phase containing said ammonium compounds;

(d) reducing the temperature of said effluent to a temperature sufficient to condense a substantial portion of said ammonia into said liquid phase;

(e) separating the remaining gas phase containing a substantial portion of said carbon dioxide from the resulting liquid phase;

(f) adjusting the pH of said liquid phase either prior to or subsequent to step (e) to a level whereby a substantial portion of said ammonia remains in said liquid phase when said liquid phase is subsequently subjected to an elevated temperature above the boiling point of water; and

(g) reducing the water content of said pH-adjusted liquid phase by evaporation.

5,183,578

PROCESS FOR THE EXTRACTION OR FLUSHING OUT OF A SUBSTANCE FROM A HETEROGENOUS SYSTEM, AND INSTALLATION FOR CARRYING OUT THE PROCESS

Zoran Dragicevic, Cacak, Yugoslavia, assignor to Laycock SA, Switzerland

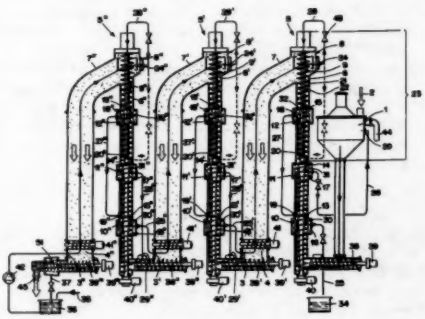
PCT No. PCT/CH90/00009, § 371 Date Nov. 9, 1990, § 102(e) Date Nov. 9, 1990, PCT Pub. No. WO90/10484, PCT Pub. Date Sep. 20, 1990

PCT Filed Jan. 16, 1990, Ser. No. 598,696

Claims priority, application Yugoslavia, Mar. 10, 1989, 502/89

Int. Cl.[5] B01D *11/02*

U.S. Cl. 210—773 **20 Claims**



1. A process for extracting or flushing out a substance from a heterogenous system with a solid phase of fibrous or granular material, comprising the following steps:

feeding the solid phase into an extraction or flushing system with at least one conveyor pipe in which conveyor means are disposed at one end of the conveyor pipe;

feeding into the other end of the conveyor pipe a liquid which, during the course of the process, forms a liquid phase which becomes increasingly charged with the substance to be extracted or flushed out;

advancing the solid phase in one direction by the conveyor means in the conveyor pipe while traversing the liquid phase through the conveyor pipe in a direction opposite to the solid phase;

compacting the solid phase in at least one compression zone as the solid phase passes through the conveyor pipe;

drawing off at least part of the liquid phase near the compaction zone;

decompacting the solid phase again in a zone past the compaction zone; and,

introducing liquid phase again which is less charged with the

substance to be extracted or flushed out than the liquid phase drawn off near the compaction zone.

5,183,579

METHOD, SYSTEM AND APPARATUS FOR HANDLING SUBSTANCES ON OR IN WATER

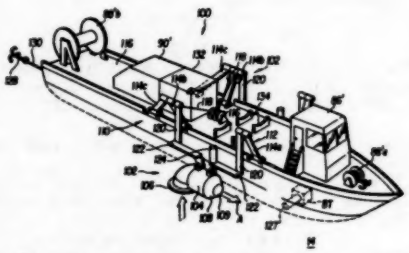
J. David Eller, P.O. Drawer "E", 33 NW. 2nd St., Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 485,625, Feb. 27, 1990, Pat. No. 5,045,216. This application Feb. 26, 1991, Ser. No. 660,938

The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.

Int. Cl.[5] E02B *15/04*

U.S. Cl. 210—776 **17 Claims**



1. A method of displacing substances and objects on and in water comprising the steps of:

providing at least one propellable surface vessel having at least one pumping means connected thereto, the pumping mean shaving an inlet and an outlet means, the inlet means is submersible and the outlet means is positionable to an orientation adjacent the water level and orientations below the water;

operating the pumping means to generate at least a substance and object displacing current flow with sufficient force so as to displace substances and objects on the water away from the vessel for contaminant control thereof, and in the water in at least a desired direction away from the vessel depending on the position of the outlet means.

5,183,580

LIQUID FABRIC CONDITIONER CONTAINING FABRIC SOFTENER AND GREEN COLORANT

Jeanie Lew, Bayside, N.Y., and Barbara H. Bory, Fort Lee, N.J., assignors to Lever Brothers Company, Division of Conopco Inc., New York, N.Y.

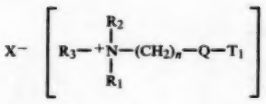
Filed Nov. 27, 1990, Ser. No. 618,443

Int. Cl.[5] D06M *13/00*

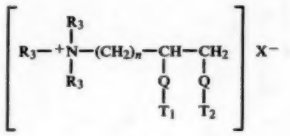
U.S. Cl. 252—8.6 **11 Claims**

1. A green-colored opaque fabric conditioning composition comprising:

a) about 1% to about 40% by weight of said composition of a fabric softening compound selected from the group consisting of di(hydrogenatedtallow)dimethyl ammonium chloride, cyclic quarternary ammonium salts, diamido quaternary ammonium salts, cationic nitrogenous salts having one long chain acyclic aliphatic C_{8-30} group, substituted imidazolinium salts, alkyl pyridinium salts, alkanamide alkylene pyridinium salts, tertiary fatty amines having at least one C_{8-30} alkyl chain, reaction products of stearic acid and aminoethylethanolamine, carboxylic acids having 8 to 30 carbon atoms and one carboxylic group per molecule, esters of polyhydric alcohols, fatty alcohols, ethyoxylated fatty alcohols, alkyl phenols, ethoxylated alkyl phenols, ethoxylated fatty amines, ethoxylated monoglycerides, ethoxylated diglycerides, ethoxylated fatty amides, mineral oils, polyols, and quaternary amonium compound of the formula:

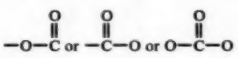


or



wherein,

Q is



R_1 is $(CH_2)_n$—Q—T_2 or T_3;

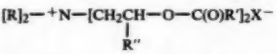
R_2 is $(CH_2)_n$—Q—T_4 or T_5 or R_3;

R_3 is C_1–C_4 alkyl;

n is an integer from 1 to 4; and

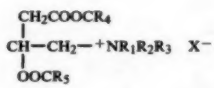
X^- is a softener-compatible anion;

a quaternary ammonium softening compound of the formula:



wherein each R substituent is a short-chain alkyl or hydroxyalkyl group or mixtures thereof; each R′ is a long-chain hydrocarbyl substituent, and R″ is a short-chain (C_1–C_4) hydrocarbyl substituent, and X^- is as defined above;

a cationic diester of the formula:



wherein R_1, R_2 and R_3 are each an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms, or a benzyl group, R_4 and R_5 are ach alkyl chains containing from 11 to 23 carbon atoms, and X^- is a water soluble anion, and mixtures thereof; and

b) about 1 ppm to about 1,000 ppm of a colorant system comprising a colorant selected from the group consisting of C.I. Pigment Green #7, C.I. Reactive Green #12, C.I. Pigment Green #13, C.I. Pigment Green #36, C.I. Reactive Green #5, C.I. Reactive Green #18 and mixtures thereof; and

c) a liquid carrier including water, the pH of the composition being less than about 7.

5,183,581

PROCESS FOR THE DEWAXING OF PRODUCING FORMATIONS

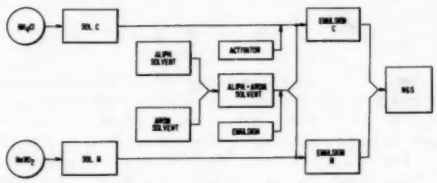
Carlos N. Khalil; Régis K. Romeu, both of Rio de Janeiro, and André Rabinovitz, Bahia, all of Brazil, assignors to Petroleo Brasileiro S.A., Rio de Janeiro, Brazil

Filed Apr. 13, 1992, Ser. No. 693,472

Claims priority, application Brazil, Aug. 24, 1990, PI BR 9004200

Int. Cl.[5] E21B *43/25, 43/28*

U.S. Cl. 252—8.552 8 Claims



1. A process for the dewaxing of producing formations by means of a water-in-oil nitrogen generating emulsion system, which comprises the steps of:

a) preparing an aqueous solution of NH_4Cl having a concentration of from 4.0 to 6.0M;

b) preparing an aqueous solution of $NaNO_2$ having a concentration of from 5.0 to 9.0M;

c) preparing an organic solvent mixture to achieve the hot dissolution of the paraffinic damage;

d) adding an emulsifier to the organic solvents mixture so that the concentration of emulsifier in the mixture comprises between 0.5 to 2.0%;

e) adding acetic acid 96% to the NH_4Cl solution;

f) adding 50% of the emulsified organic solvents mixture of step d) to the NH_4Cl and 50% of the mixture to the $NaNO_2$ solution obtaining thus a NH_4Cl emulsion and a $NaNO_2$ emulsion respectively, both emulsions being kept under agitation;

g) pumping simultaneously into the well the NH_4Cl and $NaNO_2$ emulsions, forming a mixture of equimolar NH_4Cl and $NaNO_2$ amounts thus initiating an equimolar reaction between the components mixture, this mixture producing nitrogen and heat, while pH is kept between 4.5 and 5.8; and

h) after the pumping of the treating fluid, displacing it from the well by means of an overflush with an aqueous saline fluid.

5,183,582

BLOWING AGENT-CONTAINING POLYMERIC MDI COMPOSITIONS

Jimmy L. Patterson, Huron Township, and Robert E. Riley, Flat Rock, both of Mich., assignors to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 858,787, Mar. 27, 1992. This application Jun. 1, 1992, Ser. No. 891,063

Int. Cl.[5] C09K *3/00;* C08J *9/14*

U.S. Cl. 252—182.2 5 Claims

1. A composition comprising medium viscosity polymeric MDI methylenediphenylenediisocyanate having a viscosity of from 400 to 1200 centipoise when measured at 25° C., and monochlorodifluoromethane.

5,183,583

CATALYSTS FOR EXTENDING THE SHELF LIFE OF FORMULATIONS FOR PRODUCING RIGID POLYURETHANE FOAMS

Todd W. Wishneski, Cheshire, and Donald E. Margitich, Wallingford, both of Conn., assignors to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 764,037, Sep. 23, 1991, Pat. No. 5,112,878. This application Feb. 10, 1992, Ser. No. 833,478

Int. Cl.[5] C08K *3/00*

U.S. Cl. 252—182.24 1 Claim

1. A composition, useful as a B-side polyurethane formulation in a portable foaming apparatus having a static mixer, wherein the composition comprises: a polyol, monochlorodifluoromethane, and an acid-blocked amine catalyst.

5,183,584

PEROXYGEN BLEACH ACTIVATORS AND BLEACHING COMPOSITIONS

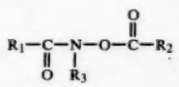
James P. Coleman, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 418,595, Oct. 10, 1989, Pat. No. 5,124,480. This application Feb. 10, 1992, Ser. No. 832,873

Int. Cl.[5] C09K *3/00*

U.S. Cl. 252—186.38 18 Claims

1. A composition comprising an inorganic persalt and an oxygen-releasing compound represented by the formula:



Wherein R_1 is selected from the group consisting of hydrogen and straight or branched chained alkyl groups having from the group consisting of 1 to 6 carbon atoms, R_2 is selected from straight or branched chain alkyl groups having from about 1 to about 12carbon atoms and R_3 is selected from the group consisting of straight or branched chain alkyl groups having from about 1 to about 3 carbon atoms.

5,183,585

LIQUID CRYSTAL EMULSION COMPOSITION

Toshiya Koyama; Yukio Matsumoto, both of Ichihara; Hataaki Yoshimoto, Chiba, and Katsuhiro Ito, Ichihara, all of Japan, assignors to Ube Industries, Ltd., Japan

Filed May 24, 1991, Ser. No. 705,567

Claims priority, application Japan, May 25, 1990, 2-134114

Int. Cl.[5] C09K *19/52, 19/00*

U.S. Cl. 252—299.01 5 Claims

1. A liquid crystal emulsion composition for forming a polymer dispersed type liquid crystal composite membrane, comprising

100 parts by weight of a liquid crystal material;

10 to 100 parts by weight of a saponification product of a polyvinyl acetate resin;

1 to 30 parts by weight of at least one aliphatic alcohol having 3 to 8 carbon atoms; and

50 to 1,000 parts by weight of water.

5,183,586

FERROELECTRIC CHIRAL SMECTIC LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL DEVICE USING SAME

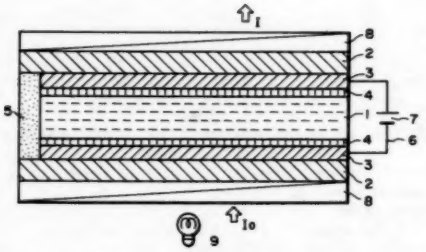
Masahiro Terada, Atsugi; Takeshi Togano, Yokohama; Masataka Yamashita, Hiratsuka; Takashi Iwaki, Isehara; Shosei Mori, and Kenji Shinjo, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1989, Ser. No. 378,923

Claims priority, application Japan, Jul. 14, 1988, 63-176588; Jun. 9, 1989, 1-147994

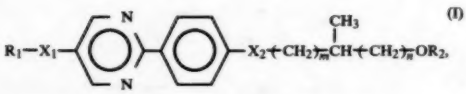
Int. Cl.[5] C09K *19/34, 19/52*

U.S. Cl. 252—299.61 7 Claims

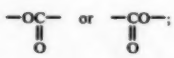


1. A ferroelectric chiral smectic liquid crystal composition, comprising:

at least one compound represented by the following formula (I):

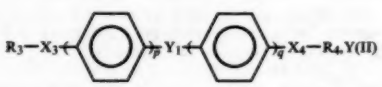


wherein R_1 denotes a linear or branched alkyl group having 1–18 carbon atoms; R_2 denotes a linear or branched alkyl group having 1–14 carbon atoms; X_1 and X_2 respectively denote a single bond, —O—,

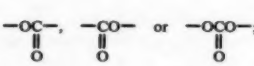


m is 0–7; and n is 0 or 1; and

at least one compound represented by the following formula (II):



wherein R_3 and R_4 denote a linear alkyl group having 1–18 carbon atoms X_3 and X_4 respectively denote a single bond, —O—,



Y_1 denotes $—CH_2O—$ or $—OCH_2—$; and p and q are 1 or 2.

5,183,587

LIQUID CRYSTALLINE COMPOUND

Kisei Kitano; Makoto Ushioda, both of Chibashi; Manabu Uchida, and Toshiharu Suzuki, both of Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

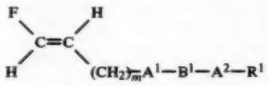
Filed Dec. 22, 1989, Ser. No. 454,988

Claims priority, application Japan, Jan. 6, 1989, 64-1004

Int. Cl.[5] C09K *19/30, 19/52;* C07C *43/225, 28/00, 25/00*

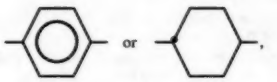
U.S. Cl. 252—299.63 9 Claims

1. A compound expressed by the formula

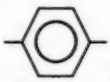


(I)

wherein R^1 represents a hydrogen atom, a fluorine atom, a chlorine atom, a cyano group, or an alkyl group or an alkenyl group each of 1 to 20 carbon atoms in which one $—CH_2—$ group or two non-adjacent $—CH_2—$ groups may be replaced by —O—, and in which alkenyl group the position and number of double bonds may be optionally chosen; A^1 and A^2 each independently represents



the hydrogen atoms(s) of which



may be replaced by fluorine atom(s), chlorine atom(s) or methyl group(s); B^1 represents $—CH_2CH_2—$, $—CH_2O—$, $—OCH_2—$ or a single bond; and m represents an integer of 0 to 20.

5,183,588

TERNARY SYSTEM BASED ON PERFLUORINATED ETHERS

Martine S. Salerno; Rémy Mounier, and Bernard Breda, all of Neuilly sur Seine, France, assignors to Yves Saint Laurent Parfums, France

Filed Apr. 4, 1990, Ser. No. 503,980

Claims priority, application France, Oct. 13, 1989, 89 13426

Int. Cl.[5] B01J *13/00*

U.S. Cl. 252—312 4 Claims

1. Emulsion comprising three phases non-miscible with one another, said phases consisting essentially of:

a first phase of about 0.1 to 5% by weight of perfluorinated ether,

a second phase comprising about 0.1 to 5% by weight of a straight-chain silicone containing a glycol group, as surfactant for forming said emulsion, and about 0.1 to 50% by weight of a cyclic-chain silicone containing a methyl group, as fluid base, and

a third phase comprising about 3 to 5% by weight of hydrating agent, and water, qs 100.

5,183,589

STABLE EMULSIONS OF PERFLUOROPOLYETHERS

Fabio Brunetta, Cornuda, and Giovanni Pantini, Milan, both of Italy, assignors to Ausimont S.r.l., Milan, Italy

Filed Mar. 30, 1990, Ser. No. 501,481
Claims priority, application Italy, Mar. 31, 1989, 19974 A/89
Int. Cl.[5] A61K *7/025, 7/40;* B01J *13/00*
U.S. Cl. 252—308 12 Claims

1. Stable emulsions of perfluoropolyethers having perfluoroalkyl end groups, consisting of:

a) from 0.1 to 75% by weight of a perfluoropolyether;

b) from 0.01% to 5% of a surfactant; and

c) from 20% to 99.89% of glycerol.

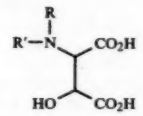
5,183,590

CORROSION INHIBITORS

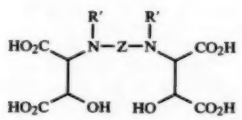
Charles G. Carter, Silver Spring; Vladimir Jovancicevic; Judith A. Hartman, both of Columbia, and Robert P. Kreh, Jessup, all of Md., assignors to W. R. Grace & Co.-Conn, New York, N.Y.

Filed Oct. 24, 1991, Ser. No. 782,359
Int. Cl.[5] C23F *11/14, 11/16*
U.S. Cl. 252—392 11 Claims

1. A method for inhibiting corrosion of ferrous metals in contact with an aqueous solution comprising adding to the system from 0.1 to 500 ppm of an aminohydroxysuccinic acid compound selected from group consisting of compounds of the generalized formulas:



wherein R is H or C_1 to C_6 alkyl, optionally substituted with —OH, —CO_2H, —SO_3H or phenyl, C_4 to C_7 cycloalkyl, or phenyl which is optionally substituted with —OH, or —CO_2H, and R' is H, C_1 to C_6 alkyl, optionally substituted with OH OH or CO_2H; and



wherein R' is as above, and Z is selected from the group consisting of i) —$(CH_2)_n$—wherein n is an integer from 2 to 10, ii) —$(CH_2)_2$—X—$(CH_2)_2$—wherein X is —0—, water soluble salts thereof.

5,183,591

ELECTROCONDUCTIVE RESIN COMPOSITION

Sumihisa Akahoshi; Hitoshi Akimura; Isao Nakabayashi, all of Yamaguchi; Masami Ishii, Aichi; Tamio Ohi, Aichi, and Makoto Yoshida, Aichi, all of Japan, assignors to Ube Cycon, Ltd., Tokyo and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Nov. 29, 1989, Ser. No. 442,590
Claims priority, application Japan, Dec. 5, 1988, 63-307478
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—503 3 Claims

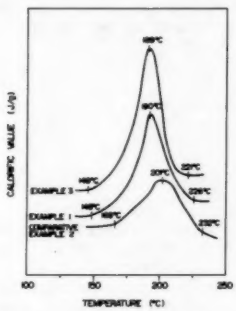
1. An electroconductive resin composition comprising 100 parts by weight of a rubber-reinforced styrene resin prepared by emulsion polymerization to have a controlled pH value of 5.0 through 9.0, 5 to 30 parts by weight of a carbon material filler and 10 to 150 parts by weight of a metal material filler incorporated into said resin, said rubber-reinforced styrene resin being at least one member selected from the group consisting of butadiene-styrene copolymer, polystyrene, acrylonitrile-butadiene-styrene copolymer, methyl methacrylate-acrylonitrile-butadiene-styrene copolymer, methyl methacrylate-butadiene-styrene copolymer, acrylonitrile-ethylene-propylene-styrene resin and acrylate styrene acrylonitrile resin, and said metal material filler being fibers or flakes of at least one member selected from the group consisting of copper, brass, aluminum and stainless steel, said electroconductive resin composition having volume-intrinsic resistance value under 4.9 ohm cm, ratio from initial value to value after one year of said volume-intrinsic resistance value being between 1.000 and 1.066.

5,183,592

ELECTROCONDUCTIVE ADHESIVE COMPRISING AN EPOXY NOVOLAK RESIN AND PHENOL-ARALKYL RESIN

Nobuo Ichimura, Takahagi; Yauso Miyamoto, and Mitsuo Yamazaki, both of Hitachi, all of Japan, assignors to Hitachi Chemical Company Ltd., Tokyo, Japan

Filed Jan. 9, 1991, Ser. No. 639,020
Claims priority, application Japan, Jan. 19, 1990, 2-011635
Int. Cl.[5] H01B *1/22*
U.S. Cl. 252—512 5 Claims



1. An electroconductive adhesive comprising:

(a) an epoxy-novolak resin,

(b) a phenol-aralkyl resin,

(c) a glycidyl group-containing silane-based coupling agent,

(d) at least one organic tetraphenyl borate, and

(e) an electroductive metal powder; the component (b) being contained in an amount to make the number of phenolic OH groups per one epoxy group of the component (a) in the range of 0.6 to 1.5, the component (c) being contained in an amount of 30 to 500% by weight based upon the weight of component (a), the component (d) being contained in an amount of 1 to 20% by weight based on the weight of component (b), and the component (e) being contained in an amount of 65 to 85% by weight based on the total weight of the components (a), (b), (d) and (e).

5,183,593

ELECTRICALLY CONDUCTIVE CEMENT

David Durand, Providence; David P. Vieau, East Greenwich; Tai S. Wei, Warwick, and Ang-Ling Chu, Cranston, all of R.I., assignors to Poly-Flex Circuits, Inc., Cranston, R.I.

Continuation-in-part of Ser. No. 436,199, Nov. 14, 1989. This application Jun. 4, 1990, Ser. No. 533,682
Int. Cl.[5] H01B *1/02*
U.S. Cl. 252—514 21 Claims

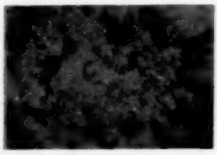
1. An electrically conductive cement for adhering and establishing electrical contact between adhered surfaces, comprising:

a mixture comprised of filler particles dispersed in a shrink-

able adhesive polymeric carrier, said filler being comprised of electrically conductive particles comprising, in combination, conductive flake particles having a thickness which is an order of magnitude smaller than their length and width and at least one member selected from the group consisting of:

(a) conductive agglomerates having a rough surface characteristic;

(b) silver-coated nickel particles;



(c) silver-coated glass spheres; and

(d) fine silver particles;

wherein said filler is provided in an amount effective to provide a moisture resistant electrical contact upon curing of said carrier, and

said carrier shrinks at least about 6.8% volumetrically upon curing; and wherein said filler is present in about 60–90 weight percent based on the combined weight of the carrier and the filler.

5,183,594

CONDUCTIVE RESIN COMPOSITION CONTAINING ZINC OXIDE WHISKERS HAVING A TETRAPOD STRUCTURE

Minoru Yoshinaka; Eizo Asakura; Mitsumasa Oku, all of Osaka; Motoi Kitano, Kawanishi; Yoshio Nakatani, Chigasaki; Hideyuki Yoshida, Amagasaki; Toshiya Hatta, Kamakura, and Seiichi Nakatani, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

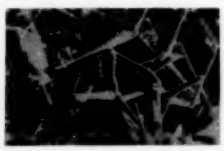
Filed Aug. 28, 1989, Ser. No. 399,116

Claims priority, application Japan, Aug. 29, 1988, 63-214007; Sep. 8, 1988, 63-225017

The portion of the term of this patent subsequent to Nov. 19, 2008, has been disclaimed.

Int. Cl.[5] H01B *1/20*

U.S. Cl. 252—518 **21 Claims**



10 μm

1. A conductive resin composition comprising conductive zinc oxide whiskers each having a tetrapod structure in an amount greater than or equal to 0.1 weight percent and a resin, said zinc oxide whiskers each being dispersed in the resin to form an electrical conducting path and said tetrapod structure comprises a central part and a needle crystal part, wherein a length from the base to the top of the needle crystal part is from 3 to 200 μm and an aspect ratio of the needle crystal part is not less than 3.

5,183,595

DEVICE FOR GASSING LIQUIDS

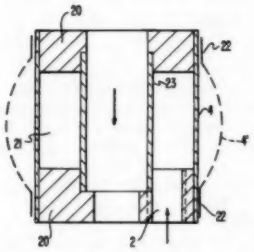
Karl H. Schüssler, Philipp-Reis-Str. 18, 6460 Gelnhausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 522,124, May 11, 1990, abandoned. This application Dec. 9, 1991, Ser. No. 807,012

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1990, 4012631

Int. Cl.[5] B01F *3/04, 5/04*

U.S. Cl. 261—64.3 **47 Claims**



1. A gas distribution device for gassing a liquid by being positioned beneath the level of the liquid and connected to a gas supply source, said device comprising:

a bubble assembly including a body member having a gas chamber, and a membrane-like wall formed of a flexible material and defining a bubble member mounted on said body member such that said bubble member defines an outer periphery of said gas chamber;

gas supply fitting means connected to said gas chamber of said body member of said bubble assembly for mounting said bubble assembly to the gas supply source such that gas from the gas supply source may be fed through said gas supply fitting means into said gas chamber;

said wall defining said bubble member having therethrough a plurality of gas discharge openings, such that when gas is supplied into said gas chamber at a pressure sufficient to overcome the pressure of the liquid, then the gas is discharged through said gas discharge openings and gasses the liquid; and

said bubble assembly being shaped annularly and defining at least one liquid channel extending through said body member, whereby as gas is discharged through said gas discharge openings into the liquid, the gas rises through the liquid as bubbles and there is created a downward flow of liquid through said liquid channel.

5,183,596

REPLACEABLE SEAL MODULE FOR LIQUID AERATORS

Richard Rajendren, Belle Plaine; Peter S. Gross, Plymouth, and Eric G. Bollensen, Columbia Heights, all of Minn., assignors to Aeromix Systems, Incorporated, Minneapolis, Minn.

Filed Dec. 13, 1991, Ser. No. 806,646

Int. Cl.[5] B01F *5/10*

U.S. Cl. 261—93 **6 Claims**

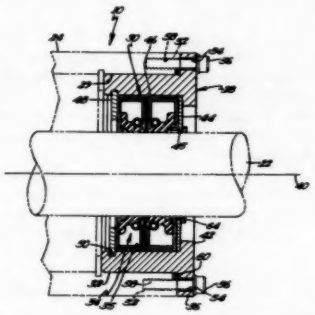
1. In an apparatus for the treatment of liquids by aeration of the type having a motor, a propeller carried by a motor driven shaft, means defining an airflow passage to the propeller, bearing support means for supporting at least one bearing, each bearing supporting the shaft at a location spaced from the motor, and at least one bearing seal positioned about the shaft between a bearing and the propeller, the improvement comprising:

a housing surrounding at least a portion of the shaft;

a module having a flange portion, the module carrying at least the bearing seal and being detachably secured about the shaft to facilitate removal of the bearing seal wherein

at least a portion of the module is positioned within the housing;

a plurality of bolts attaching the module to the housing at the flange portion; and



sealing means positioned between the flange portion and the housing to prevent liquid from entering an interior of the housing between the flange portion and the housing.

5,183,597

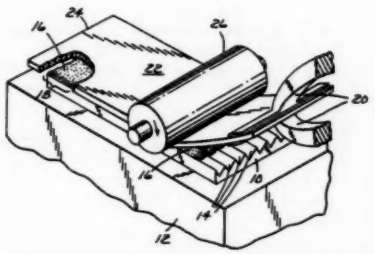
METHOD OF MOLDING MICROSTRUCTURE BEARING COMPOSITE PLASTIC ARTICLES

Shih-Lai Lu, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 444,361, Dec. 8, 1989, which is a continuation-in-part of Ser. No. 309,415, Feb. 10, 1989, abandoned. This application Feb. 25, 1991, Ser. No. 660,643

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.4 **18 Claims**



1. A method of producing a composite plastic article that has a utilitarian microstructure, which microstructure is at least 0.025 mm in depth, said method comprising the steps of:

a) preparing a UV-curable oligomeric resin composition of a one-part, solvent-free, radiation addition-polymerizable, crosslinkable, organic oligomeric composition having hard segments and soft segments;

b) depositing a bead of that oligomeric resin composition along one edge of a master negative microstructure molding surface;

c) covering the master with a preformed substrate, at least one of the master and substrate being flexible;

d) applying force progressively to the substrate to advance the bead of resin while applying sufficient pressure to fill the cavities of the master such that the deposited resin does not protrude beyond the cavities to more than 20% of the depth of the cavities;

e) curing the deposited oligomeric resin by ultraviolet radiation to provide a composite of said substrate and cured oligomeric resin; and

f) removing the resulting microstructure-bearing composite of the substrate and cured resin.

5,183,598

PROCESS OF AND APPARATUS FOR MAKING THREE-DIMENSIONAL OBJECTS

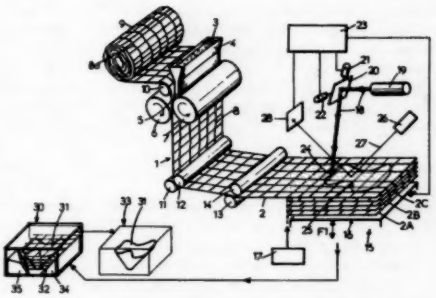
Jean-Louis Hellé, Gouvieux; Jean-Claude André, and Philippe Schaeffer, both of Nancy, all of France, assignors to Dassault Aviation, Paris, France

Filed Mar. 4, 1991, Ser. No. 664,626

Claims priority, application France, Mar. 20, 1990, 90 03521

Int. Cl.[5] B29C *35/08, 67/12*

U.S. Cl. 264—22 **14 Claims**



1. A process for the production of objects of defined shape, comprising the following steps:

a) providing at least one thin layer which, when it is subjected to a defined radiation, undergoes a change of solubility in at least one specified solvent, accompanied by a change of volume less than a predetermined limit,

b) reinforcing at least one of said thin layers with fibers or with a screen,

c) scanning said first thin layer with a beam of said radiation, according to a trace specified in advance and under conditions of intensity and of duration which are capable of causing said change of solubility,

d) providing a second thin layer of the same material and superposing it on the first,

e) scanning said second thin layer with a beam of the same radiation, according to a trace such that and under conditions such that said change of solubility occurs in the second layer and that the volume of the second layer which is affected by said change of solubility is capable of forming at least one volume continuous with that volume of the first layer which has been previously affected by said change of solubility,

f) causing the adhesion of said second layer on the first layer, at least in the region of these two layers which, after their respective irradiation, have the lowest solubility, in such a manner as to constitute a continuous volume of material having lower solubility,

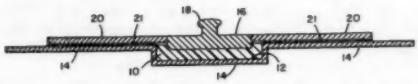
g) repeating the operations d) to f) until the volumes of material having lower solubility of the successive layers constitute together an integral unitary volume having the shape of the desired object,

h) placing the stack formed by the superposed successive layers in contact with said solvent in such a manner as to separate the parts of material having lower solubility from the parts of material having higher solubility, wherein step f) occurs before the step e) of after the step g).

5,183,599
RAPID CURING, ELECTRICALLY CONDUCTIVE ADHESIVE

Jack H. Smuckler, 9 Country La., Marblehead, Mass. 01945

Division of Ser. No. 467,743, Jan. 19, 1990, Pat. No. 5,124,076.
This application Jun. 18, 1991, Ser. No. 700,270
Int. Cl.[5] B29C *71/04*
U.S. Cl. 264—22 **9 Claims**



1. An improved method of in situ polymerization of an adhesive, conformable, electrically conductive hydrogen for use in a biomedical electrode, comprising a disc having a first surface and a second, skin-directed surface, the first surface of said disc being associated with means for electrically connecting said disc to a lead wire and said second, skin-directed surface being associated with a conformable, adhesive, ionic, polymeric conductive hydrogel, said hydrogen enhancing the electrical connection with the skin, said method comprising:

forming said conductive material on said electrode by the steps of:

assembling a precursor of said conductive material comprising:

an aqueous mixture of an N-vinyl lactam monomer, an acrylic monomer, a water-soluble cross-linking agent, a photoinitiator and an ionizable salt, wherein the ratio of N-vinyl lactam to acrylic monomer is between about 1:10 to 10:1 and wherein the amount of water comprises at least about 50 percent by weight of said mixture,

placing said precursor in a well defined by a UV translucent abhesive material,

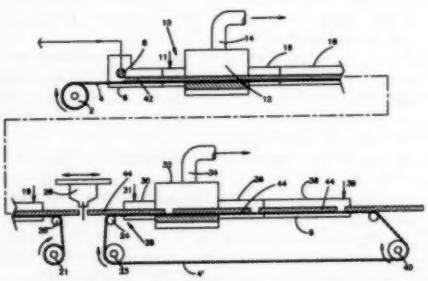
placing the skin-directed surface of said disc in contact with the precursor, and

polymerizing said precursor by exposing said precursor to UV light for less than 30 seconds, thereby forming an electrically conductive, pressure-sensitive adhesive hydrogel in contact with said disc to produce said electrode.

5,183,600
METHOD AND APPARATUS FOR CONTINUOUS CASTING OF POLYMERIZABLE MATERIAL

Herbert I. Scher, Pikesville; Israel S. Ungar, Randallstown, and Richard R. Baehr, Jr., Annapolis, all of Md., assignors to Nevamar Corporation, Odenton, Md.

Filed Jul. 19, 1991, Ser. No. 732,662
Int. Cl.[5] B29C *35/10*
U.S. Cl. 264—26 **7 Claims**



1. A method of continuously casting a polymerizable liquid material which contains a particulate filler and which shrinks during polymerization to produce a sheet substantially free of warp, consisting essentially of:

(a) depositing a controlled amount of a liquid mixture containing said material on a web having an upstream direction and a downstream direction and moving at a predetermined speed to provide a moving mixture of controlled thickness;

(b) heating said mixture substantially uniformly throughout its cross section by radio frequency energy downstream of said depositing step at least to a temperature sufficient to initiate polymerization;

(c) providing conditions which isolate shrinkage forces that occur in said mixture further downstream from said heating from transmission upstream;

(d) maintaining said isolated mixture for a time thereafter in substantial thermal isolation and free of substantial constraining forces such that polymerization and further shrinkage occurs in a substantially adiabatic manner;

whereby a sheet is provided free of substantial warp.

4. An apparatus for continuous casting of a polymerizable material which contains a particulate filler and which shrinks upon curing, comprising:

(a) means for depositing a controlled amount of a mixture containing said material on a web having an upstream direction and a downstream direction and moving at a predetermined speed to provide a moving mixture of controlled thickness;

(b) means for heating said mixture substantially uniformly throughout its cross section by radio frequency energy downstream of said depositing step at least to a temperature sufficient to initiate polymerization;

(c) means for isolating shrinkage forces that occur in said mixture further downstream from said heating point from transmission upstream; and

(d) means for maintaining said mixture thereafter in substantial thermal isolation such that substantially adiabatic polymerization and further shrinkage occurs.

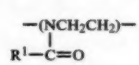
5,183,601
DETERGENT COMPOSITION CONTAINING POLYETHYLENIMINE CO-POLYMER

Yasuhiro Jisai; Yukiomi Tanaka, both of Chiba, and Akira Shigeta, Tokyo, Japan, assignors to Kao Corporation, Tokyo, Japan

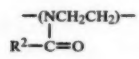
Filed May 28, 1991, Ser. No. 706,210
Claims priority, application Japan, Jun. 7, 1990, 2-149192; Jun. 7, 1990, 2-149193; Jun. 7, 1990, 2-149195; Jun. 7, 1990, 2-149196; Jun. 7, 1990, 2-149198
Int. Cl.[5] C11D *3/28, 1/02, 1/66, 1/90*
U.S. Cl. 252—524 **16 Claims**

1. A detergent composition comprising:

(A) a polymeric compound comprising recurring units (I-1) and I-2) at a ratio by weight of 9:1–1:9,



(I-1)



(I-2)

wherein R^1 is a hydrogen or a methyl or ethyl group, R^2 represents an alkyl, aryl or aralkyl group having 4–15 carbon atoms, and

(B) at least one different compound selected from the group consisting of monomeric anionic surface active agents, monomeric nonionic surface active agents, monomeric amphoteric surface active agents, monomeric cationic surface active agents,

wherein the weight ratio of component (A) to component (B) is form 5/1 to 1/5.

5,183,602

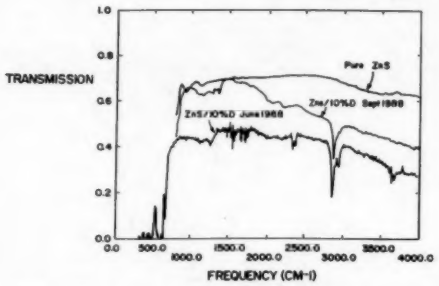
INFRA RED DIAMOND COMPOSITES

Rishi Raj; Albert J. Sievers, both of Ithaca, N.Y.; Liang Yue, Ann Arbor, Mich., Tae Won Noh, Seoul, Rep. of Korea, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 18, 1989, Ser. No. 408,634

Int. Cl.[5] F21V *9/04;* C03C *27/02;* B05D *3/06*

U.S. Cl. 252—587 10 Claims



1. An infrared transmitting composite which comprises finely divided diamond particles having a particle size of from about 0.01 to 5 micrometer diameter uniformly dispersed in a matrix that transmits infrared light wherein said diamond particles are present in the composite at a volume concentration of from about 0.1 to about 75 volume percent; wherein said matrix is selected from the group consisting of one or more of the following:

zinc sulfide, zinc selenide, barium monosulfide, calcium sulfide, carbon fluoride, magnesium sulfide, cadmium telluride, gallium arsenide, thorium chloride, thorium iodide, thorium tetrafluoride, arsenic trisulfide and tin iodide and wherein said composite exhibits improved mechanical properties and toughness over that of the matrix alone.

5,183,603

PROCESS FOR PRODUCING A COIL-SHAPED CARBON FIBER BUNDLE

Eiji Kitajima, Izumi; Takashi Oyama; Eiji Maruden, both of Izumi-Otsu; Hirokazu Teraoka, Sakai; Haruki Yamasaki, Isehara, and Susumu Shimizu, Chuo, all of Japan, assignors to Koa Oil Company Limited and Tanaka Kikinzoku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 22, 1991, Ser. No. 780,301

Claims priority, application Japan, Oct. 24, 1990, 2-286323; Feb. 7, 1991, 3-60886

Int. Cl.[5] D01F *9/12*

U.S. Cl. 264—29.2 9 Claims

1. A process for producing a coil-shaped carbon fiber bundle comprising the steps of:

compositing at least two pitches wherein the maximum difference in coefficient of linear contraction in the direction of a fiber axis during carbonization of spun pitches is at least 5% and the difference in the softening points of the pitches to be composited is within 10° C. so as to spin the thus composited pitches as single fibers; bundling the thus spun single fibers to form a fiber bundle; then infusibilizing the resulting fiber bundle under tension; and carbonizing the fiber bundle, wherein the stretch characteristics of the resulting coil-shaped carbon fiber bundle is controlled by adjusting one or more of the discharge proportion of the spinning pitches to be composited, the size of the diameter of fibers to be spun or the number of fibers to be bundled.

5,183,604

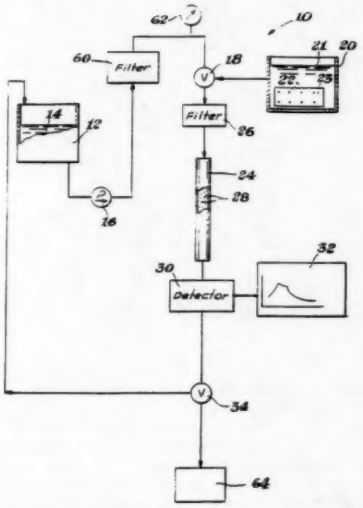
SIZE SEPARATION OF PARTICLES CONTAINED WITHIN A MATERIAL BY THE USE OF NONAQUEOUS HYDRODYNAMIC CHROMATOGRAPHY

Martin A. Langhorst, Midland, Mich., and Joseph B. Henry, Pickerington, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 24, 1992, Ser. No. 825,353

Int. Cl.[5] B29C *45/00;* B01D *15/08*

U.S. Cl. 264—40.1 14 Claims



1. In a method for producing a water insoluble matrix containing a desired size distribution of a non continuous phase material of the type where a quantity of a monomer material and a quantity of a non continuous phase material are added through control means to a polymerization system, then mixed, polymerized, and finally extruded, the improvement consisting of:

removing a sample from the system after initial mixing but before the polymerization is complete;

determining the distribution according to size of the sample by nonaqueous hydrodynamic chromatography, which includes the steps of:

a. placing the sample in a solvent effective for dissolving the matrix thereby forming a mixture of the particles dispersed in a solution comprising the solvent and the matrix;

b. adding a controlled amount of the mixture to an essentially nonaqueous carrier liquid;

c. eluting the carrier liquid containing the mixture through a separating medium effective for sorting the particles according to size wherein the largest particles are eluted first and the smallest particles are eluted last;

d. monitoring the effluent from the separating medium by measuring and recording a signal representing a physical property of the effluent that is responsive to the concentration of particles in the effluent;

comparing the results from the nonaqueous hydrodynamic chromatography analysis to the desired size distribution;

making adjustments in the control means and/or the supply of the non continuous phase material in order to make the polymerized product more closely resemble the desired product.

5,183,605

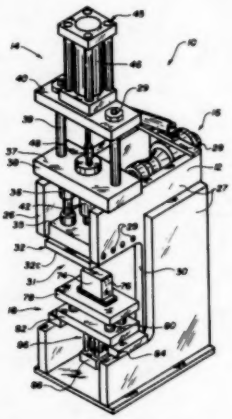
METHOD FOR INJECTION INTO A SELF-CLAMPING MOLD

Robert L. Brown, Hartville, and David E. Baxter, Ravenna, both of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Continuation-in-part of Ser. No. 621,675, Nov. 30, 1990, abandoned. This application Aug. 28, 1991, Ser. No. 751,353

Int. Cl.[5] B29C *45/76*

U.S. Cl. 264—40.5 **3 Claims**



1. A method of injecting molding material into a self-clamping mold comprising the steps of:

supporting said mold in a support frame clamped in engagement with an injector using a lift mechanism,

pre-determining the pressure required to inject material into said self-clamping mold and to be applied by said lifting mechanism to maintain the condition and position of said self-clamping mold during injection of molding material as a function of the area of exposed sprue openings in said self-clamping mold,

transferring molding material into said injector,

controlling the temperature of molding material transferred to said self-clamping mold, and

injecting molding material into said self-clamping mold under said predetermined pressure using said injector while clamping said mold within said frame with a force of less than 25 tons using a lifting mechanism to maintain said mold condition and position.

5,183,606

METHOD OF MAKING A PLASTIC FOIL AND FOR WINDING THE PLASTIC FOIL INTO A COIL OR ROLL

Willi Predöhl, Hennef 1- Brol, Fed. Rep. of Germany, assignor to Reifenhauser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Apr. 19, 1991, Ser. No. 688,927

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1990, 4013611

The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.

Int. Cl.[5] B29C *47/92, 55/28*

U.S. Cl. 264—40.1 **8 Claims**

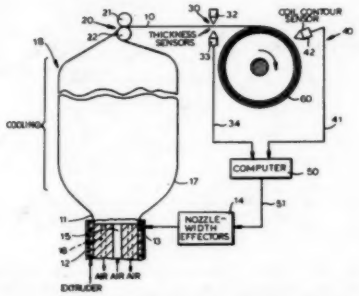
1. A method of making a coil of a plastic foil, the method comprising the steps of:

a) continuously forming a flat web of a plastic foil having over a width thereof a thickness-error profile including system-produced plus thickness errors and minus thickness errors;

b) winding said web into a coil;

c) monitoring at the coil deviations of the coil from a substantially cylindrical contour, and feeding a signal representing the deviations to a computer;

d) automatically deriving from the signal with said computer a thickness correction by which the thickness of a zone between two regions with plus thickness errors must be increased to eliminate a bulge in the coil at said zone with plus thickness errors and controlling the forming of the web to increase the thickness of the web at said zone by said thickness correction;



e) maintaining said increase in the thickness of said web at said zone for a length of said web would on said coil to maintain a substantially cylindrical contour thereof; and

f) iteratively repeating steps c) to e) until said coil is completely wound with said web, thereby forming a complete coil with a substantially constant cross section cylindrical contour.

5,183,607

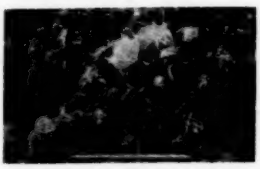
POLYMER MEMBRANES FOR SEPARATION PROCESS

George H. Beall, 106 Woodland Dr.; Kishor P. Gadkaree, 273 Orchard Dr., both of Big Flats, N.Y. 14814; Thomas P. Grandi, 303 Home St., Elmira, N.Y. 14904, and Candace J. Quinn, 419 Hornby Rd., Corning, N.Y. 14830

Filed Dec. 17, 1991, Ser. No. 808,814

Int. Cl.[5] B29C *65/00*

U.S. Cl. 264—41 **6 Claims**



1. A method comprising: making a semi-permeable microporous polymer body having an intercommunicating pore structure, said body having a pore volume of at least about 50 percent and a mean pore diameter in the range of about 0.1–10 microns, by the steps of:

(i) melt-mixing a batch mixture of a thermoplastic polymer and a finely divided leachable glass to form a two-phase glass-polymer blend comprising a continuous polymer network and an intercommunicating glass phase;

(ii) forming the blend into a glass-polymer body of a selected shape; and

(iii) leaching the intercommunicating glass phase from the glass-polymer body without disruption of the continuous polymer network;

thus to provide a microporous polymer body comprising an intercommunicating pore structure.

5,183,608

METHOD OF MAKING DIESEL PARTICULATE FILTERS

Donald L. Guile, Horseheads, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Jan. 3, 1992, Ser. No. 816,226
Int. Cl.[5] B29C *47/00;* C04B *33/32, 35/64, 41/81*
U.S. Cl. 264—44 18 Claims

1. A method of making a ceramic article having pores, suitable for use as a diesel particulate filter comprising the steps of:

blending graphite, water insoluble cellulose, and ceramic-forming precursors with an effective amount of vehicle and forming aids to form a plastic mixture;

forming said plastic mixture into a green body;

drying dielectrically said green body; and

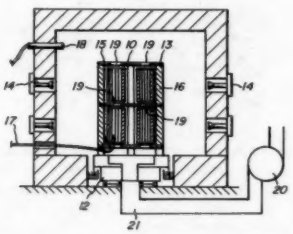
firing said dried green body under conditions effective to form said ceramic article having pores, wherein said graphite and said water insoluble cellulose are blended with said ceramic-forming precursors, said vehicle, and said forming aids in an amount effective to achieve an overall porosity of 45 to 55% in said ceramic article and to permit drying of said green body to occur with substantially no arcing or shorting.

5,183,609

METHOD OF MANUFACTURING CERAMIC HONEYCOMB-STRUCTURAL BODY

Kazuhiro Miyahara, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

PCT No. PCT/JP89/00139, § 371 Date Aug. 18, 1989, § 102(e) Date Aug. 18, 1989, PCT Pub. No. WO89/07584, PCT Pub. Date Aug. 24, 1989
PCT Filed Feb. 10, 1989, Ser. No. 397,499
Claims priority, application Japan, Feb. 10, 1988, 63-27616
Int. Cl.[5] B29C *65/00;* F27D *21/00*
U.S. Cl. 264—44 1 Claim



1. A process for producing a honeycomb-structural body, comprising the steps of:

preparing a mixture of ceramic material and at least one component selected from the group consisting of molding aids and pore-forming agents;

preparing an extrudable green ceramic material from said mixture;

extruding said prepared extrudable green ceramic material to form a honeycomb-structural body;

providing a first thermocouple in a through-hole of said honeycomb-structural body and a second thermocouple outside said honeycomb-structural body; and

firing said honeycomb-structural body in a firing atmosphere while minimizing a differential temperature condition measured between interior and exterior portions of said honeycomb-structural body by increasing the oxygen concentration in the firing atmosphere in a range of firing temperatures which is outside a temperature range within which thermal decomposition of said at least one component occurs, and decreasing the oxygen concentration in the firing atmosphere in a range of firing temperatures which corresponds to said temperature range within which thermal decomposition of said at least one component occurs;

wherein said at least one component is substantially completely removed from said honeycomb-structural body during said firing as a result of said increasing and said decreasing oxygen concentration in the firing atmosphere.

5,183,610

ALUMINA-ZIRCONIA CERAMIC

Terrence K. Brog, Littleton, Colo., and William R. Manning, Richmond, Mich., assignors to Cooper Indusries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 287,693, Dec. 20, 1988, abandoned, which is a continuation-in-part of Ser. No. 76,439, Jul. 22, 1987, abandoned. This application Dec. 20, 1990, Ser. No. 647,197
Int. Cl.[5] C04B *35/10*
U.S. Cl. 264—56 4 Claims

1. A method for producing a ceramic which consists essentially of formulating a batch composed of from 6 to 95 percent of particulate ZrO_2 and from 5 to 94 percent of particulate Al_2O_3 from particulate Al_2O_3, particulate ZrO_2 is in a tetragonal crystal structure as a consequence of an oxide dissolved therein to promote retention of the metastable tetragonal crystal structure and particulate ZrO_2 which has a monoclinic crystal structure, comminuting the batch, compacting the comminuted batch into a shape, firing the shape, and controlling the degree of comminution of the batch, the firing conditions and the proportions of oxide and of tetragonal and monoclinic ZrO_2 in the batch to produce a dense, gas impervious ceramic which contains both metastable tetragonal and monoclinic ZrO_2, and in such proportions that the ceramic has a strength, as indicated by the modulus of rupture, at least 5 percent greater than that of the stronger of two otherwise identical ceramics, one wherein all of the ZrO_2 in the batch is in a metastable tetragonal and one wherein all of the ZrO_2 in the batch is in a monoclinic crystal structure.

5,183,611

METHOD OF PRODUCING POLYMER ARTICLE HAVING METALLIZED SURFACE

Ryutoku Yosomiya; Mistutoshi Hirata, both of Funabashi; Kiyotaka Morimoto, Koshigaya; Soichiro Takenishi, Tokushima, and Toshinori Marutsuka, Tokyo, all of Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Nov. 30, 1988, Ser. No. 278,202
Claims priority, application Japan, Nov. 30, 1987, 62-299878
Int. Cl.[5] B05D *3/10*
U.S. Cl. 264—129 8 Claims

1. A method of producing a polymer article having a metallized surface, which consists essentially of dissolving a polymer and a salt of a metal selected from the group consisting of iron, copper, nickel and cobalt in a common solvent, forming a polymer article containing the said metal salt dispersed therein from the solution, and then treating the article with a reducing agent the amount of the metal salt being from 1 to 200 parts by weight per 100 parts by weight of the polymer.

5,183,612

PROCESS AND APPARATUS FOR MANUFACTURING FRAME WITH GROOVE FOR USE WITH PANEL

Yoshihiro Suita, and Tosikazu Ito, both of Obu, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jan. 14, 1992, Ser. No. 820,247
Claims priority, application Japan, Jan. 14, 1991, 3-014770
Int. Cl.[5] B29C *41/24, 41/44, 47/08*
U.S. Cl. 264—145 7 Claims

1. A process for manufacturing a frame with a groove such as a molding for use with a panel such as a windshield of an automobile, comprising the steps of:

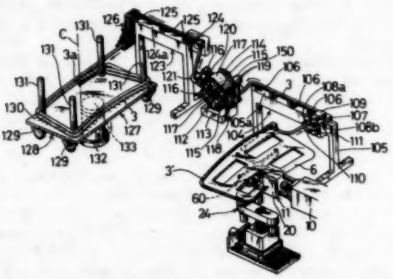
providing a dummy panel having an outer configuration and a thickness equal to those of said panel;

providing molding die means having an extrusion port for extruding a molding material to form a molding product;

engaging a part of the peripheral edge of said dummy panel into said extrusion port of said molding die means;

continuously extruding said molding material from said extrusion port of said molding die means;

continuously moving said extrusion port of said molding die means along the peripheral edge of said dummy panel by



providing three-dimensional relative movement between said molding die means and said dummy panel so that said molding product is continuously formed over the entire length of the peripheral edge of said dummy panel; and

stripping said molding product from the peripheral edge of said dummy panel to obtain said frame with a groove, the groove being closely engageable with the peripheral edge of said panel.

5,183,613

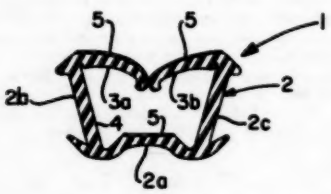
PROCESS FOR THE PREPARATION OF SOLVENTLESS, LOW FRICTION, ABRASION-RESISTANT COATINGS FOR ELASTOMERIC SUBSTRATES

Charles O. Edwards, Akron, Ohio, assignor to GenCorp Inc., Fairlawn, Ohio

Division of Ser. No. 571,485, Aug. 22, 1990, abandoned. This application Oct. 10, 1991, Ser. No. 773,744

Int. Cl.[5] B29C *47/06*

U.S. Cl. 264—171 **12 Claims**



1. A method for forming a composite, comprising the steps of:

contacting a solvent-free, substantially melted polyolefin compound with an uncured elastomeric substrate, said polyolefin compound having a low melt index and a high density, and optionally containing a softening compound; and

curing said elastomeric substrate, so that said polyolefin compound is adhered to said elastomeric substrate and provides a solid, low-friction, abrasion-resistant coating on said substrate.

5,183,614

METHOD FOR PRODUCING X-RAY DETECTABLE SPANDEX FIBERS

Allan R. Champion, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 26, 1989, Ser. No. 301,470

The portion of the term of this patent subsequent to Jan. 2, 2009, has been disclaimed.

Int. Cl.[5] D01F *6/70*

U.S. Cl. 264—184 **9 Claims**

1. A process of producing an X-ray detectable spandex fiber comprising:

a) dissolving a long chain synthetic polymer comprising at least 85% segmented polyurethane in an organic solvent to form a polymer spinning solution;

b) blending a finely divided X-ray opaque filler material comprising an element of atomic number of at lest 20 into the polymer spinning solution before forming the fiber, wherein the amount of X-ray opaque filler material is at least 25% by weight of the total polymer and filler material;

c) air gap spinning fibers from the polymer solution/X-ray opaque filler material blend; and

d) passing the fibers through an aqueous bath.

5,183,615

MOLDING METHOD OF AIR BAG COVER

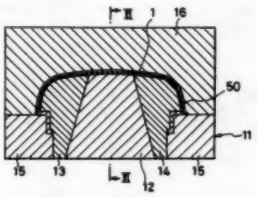
Takayasu Zushi, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

Filed Oct. 16, 1991, Ser. No. 777,633

Claims priority, application Japan, Nov. 13, 1990, 2-306623

Int. Cl.[5] B29C *45/16, 45/40*

U.S. Cl. 264—219 **2 Claims**



1. A method of molding a module cover for an air bag device of first and second synthetic resin materials, the module cover having a main cover portion, edge portions, and at least one pair of undercut portions formed at the edge portions of the main cover portion, comprising,

preparing first and second upper molds for forming an outside of the main cover portion, and a lower mold for forming an inside of the main cover portion and the undercut portions, the first upper mold being smaller than the second upper mold, the lower mold including a central mold for molding a central section of the inside of the main cover portion, at least one pair of lateral molds for molding side sections of the inside of the main cover portion and insides of the edge portions and the undercut portions, the pair of lateral molds being arranged symmetrical to the central mold, and a frame mold for molding outsides of the edge portions and the undercut portions, the central mold and the frame mold being connected together as one unit, the central mold and the lateral molds having oblique mating faces so that the lateral molds are slidable laterally to be located above the central mold away from the edge portions of the module cover,

disposing the first upper mold over the lower mold to define a first cavity therebetween,

injecting the first resin material into the first cavity and hardening the first resin material to form a core layer comprising the main cover portion, the edge portions and the undercut portions of the module cover,

removing the first upper mold and placing the second upper mold over the main cover portion of the core layer in engagement with the lower mold, to form a second cavity between the core layer and the second upper mold about the main cover portion of the core layer,

injecting the second resin material into the second cavity and hardening the second resin material to form a skin layer over the main cover portion of the core layer,

removing the second upper mold from the skin layer,

separating the frame mold and the central mold as one unit from the core layer while moving inside the core layer the lateral molds toward each other slidably along the oblique mating faces of the lateral molds and the central mold so that the lateral molds are located away from the edge portions of the core layer, and

removing the lateral molds from the core layer to form the module cover comprising the main cover portion, the edge portions, and the at least one pair of undercut portions formed at the edge portions, wherein the main cover portion includes the core layer of the first synthetic resin material and the skin layer of the second synthetic resin material.

5,183,616

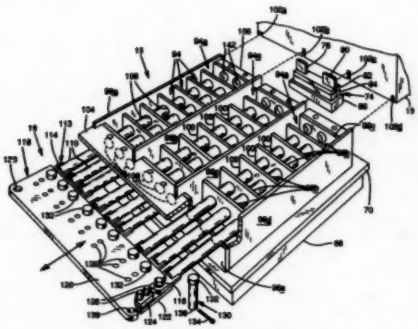
METHOD FOR MAKING ANTIQUED CONCRETE CORED BRICKS AND CAPPING BRICKS

Thomas W. Hedrick, Sikeston, Mo., assignor to Hedrick Concrete Products Corp., Sikeston, Mo.

Filed Nov. 7, 1989, Ser. No. 433,044

Int. Cl.[5] B28B *1/08, 3/02, 7/24;* **B29C** *43/02*

U.S. Cl. 264—219 **4 Claims**



1. A method for making concrete cored bricks and capping bricks comprising:

providing a mold having a row of mold cavities separated by cross members, each cross member having at least one core-bar hole formed therein, and each mold cavity being defined by a front cross member and a rear cross member, the row of mold cavities ending with a back cavity in which a capping brick is formed;

inserting a core bar through each core-bar hole in each cross member of each mold cavity preceding the back cavity, and into and filling the core-bar hole in the front cross-member associated with the back cavity, wherein the core bar does not extend through the back mold cavity and into the core-bar hole in the rear cross member of the back cavity;

plugging the core-bar in the rear cross member associated with the back cavity with a plugging means thereby providing for the formation of a capping brick therein;

filling the mold cavities with concrete to form plural uncured bricks, including at least one cored brick and at least one capping brick;

compacting the bricks;

removing the core bar from the mold cavities; and

ejecting the bricks from the mold.

5,183,617

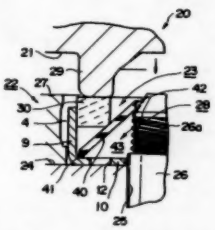
METHOD OF MANUFACTURING A HERMETIC SEALING APPARATUS FOR SEALING TWO MEMBERS WHICH ROTATE RELATIVE TO EACH OTHER

Takayuki Saitoh, Fukushima, Japan, assignor to NOK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 627,892, Dec. 13, 1990, Pat. No. 5,106,565, which is a continuation of Ser. No. 260,406, Oct. 20, 1988, abandoned. This application Oct. 11, 1991, Ser. No. 775,331

Int. Cl.[5] B29C *43/18*

U.S. Cl. 264—249 **2 Claims**



1. A method of manufacturing a hermetic sealing apparatus for sealing two members rotating relative to each other with a lubricant on one side and atmosphere on another side, said hermetic sealing apparatus comprising a first annular seal ring made of rubber-like resilient material on the lubricant side, a second annular seal ring made of resin material on the atmosphere side, and an annular metal backup ring, said manufacturing method comprising the steps of:

providing a mold having a central core;

preparing a conical resin sheet for the second annular seal ring said resin sheet being entirely made of polytetrafluorethlene;

placing said annular metal backup ring in said mold, said annular metal backup ring having substantially an L-shaped cross section composed of a cylindrical portion and a radially inward extending flange portion with a plurality of circumferentially spaced holes formed in said flange portion;

placing said second annular seal ring entirely made of polytetrafluoroethlene in said mold with a circumferential portion of said second annular seal ring covering said flange portion of said annular metal backup ring so that one end portion of said second annular seal ring abuts against the flange portion of the L-shaped annular metal backup ring and another end portion leans on the central core of the mold;

placing the rubber-like resilient material for forming said first annular seal ring in said mold, said rubber-like resilient material contacting said cylindrical portion of said annular metal backup ring and an inner side surface of said second seal ring, and subjecting said rubber-like resilient material to pressure to form said first annular seal ring; and

deforming said second annular seal ring so as to protrude into each of said holes of said flange portion of the annular metal backup ring by the pressurized rubber-like resilient material;

whereby said protruding of the second annular seal ring into the holes of said flange portion of the annular metal backup ring firmly secures and fixes said second annular seal ring between said first seal ring and said flange portion.

5,183,618

PROCESS FOR MANUFACTURING A SKI

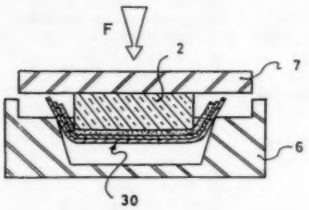
Roger Pascal, Annecy Le Vieux, and Gilles Recher, Annecy, both of France, assignors to Salomon S.A., Chavanod, France

Filed Feb. 22, 1988, Ser. No. 158,925

Claims priority, application France, Feb. 27, 1987, 8703119; Sep. 23, 1987, 8713398

Int. Cl.[5] B29C *43/00*

U.S. Cl. 264—257 **60 Claims**



1. A process of manufacturing a ski whose body comprises a core covered with a shell, said shell comprising a sub-assembly, said process comprising the steps of:

(a) positioning said sub-assembly adjacent a mold cavity of a mold;

(b) positioning said core adjacent said shell; and

(c) exerting a force against said core to force said shell within said mold cavity.

5,183,619

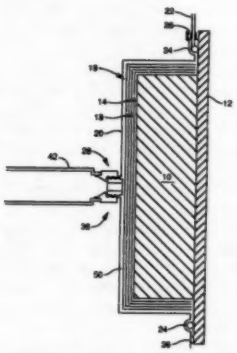
PROCESS FOR FORMING FIBERGLASS ARTICLES

Robert J. Tolton, 2405 N. 2300 E., Layton, Utah 84040

Filed May 9, 1991, Ser. No. 698,008

Int. Cl.[5] B28B *7/30*

U.S. Cl. 264—257 **12 Claims**



1. A process of applying a fluid through a vacuum bag in the, forming of a plastic article, said process comprising the steps of:

applying at least one layer of dry laminate material onto a mold;

positioning a vacuum path about the mold, the vacuum path including at least one bleeder line about the mold;

placing a vacuum bag over the laminate;

partially sealing the vacuum bag;

inserting at least one valve nozzle between the vacuum bag and the laminate;

attaching a tube connector with a resin reservoir thereon onto each valve nozzle;

sealing the vacuum bag to the mold;

applying vacuum to the vacuum path;

opening a flow path through the valve nozzle by breaking a blocking section of the vacuum bag therein;

putting the fluid into the reservoir;

raising the valve nozzle to allow the fluid to be vacuum pulled into the laminate; and

lowering the valve nozzle to stop the fluid flow.

5,183,620

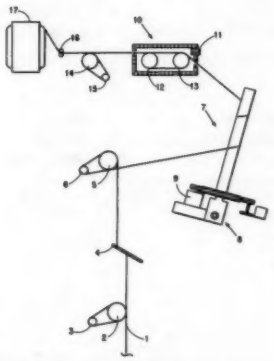
PROCESS OF DRAWING YARN USING AN OSCILLATING DRAW ASSIST ELEMENT

James E. Duncan, and Dean H. Smiley, both of Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 561,035, Aug. 1, 1990, abandoned. This application Dec. 28, 1990, Ser. No. 635,917

Int. Cl.[5] D02J *1/22*

U.S. Cl. 264—290.7 **9 Claims**



1. In a process in which polyamide yarn having a lubricating finish is drawn while being spirally advanced in frictional contact with the outer surface of a yarn draw assist element, said outer surface of said draw assist element moving at a speed at least 100 times slower than the speed at which the yarn is advanced, and said yarn directly advancing from said yarn draw assist element to a roll initial contact location on a pair of spaced-apart heated rolls and spirally advancing on said rolls through at least one wrap in contact with the outwardly-facing surfaces of said heated rolls, the distance that the yarn spirally advances longitudinally in said wrap defining the wrap advance on said rolls, the improvement comprising oscillating said roll initial contact location of said rolls by moving said outer surface of said draw assist element in relation to said pair of heated rolls to oscillate said wrap on said rolls a distance which is at least equal to said wrap advance.

5,183,621

METHOD OF BOTH SINGLE AND DOUBLE INJECTION MOLDING

Makoto Yukihiro, and Mamoru Katagiri, both of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Feb. 14, 1991, Ser. No. 655,497

Int. Cl.[5] B29B *11/08*; C29C *45/07, 45/10*

U.S. Cl. 264—297.2 **1 Claim**

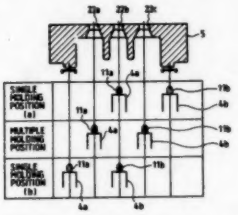
1. A method of performing single and double injection molding, comprising:

moving a transverse moving unit in a transverse direction parallel to a stationary platen having three laterally positioned nozzle insertion holes at equal intervals in a horizontal rod, so that two injection units provided parallel to each other and slidably supported on support members

fixedly attached to said moving unit are moved and positioned in a double injection molding position in which nozzles of said injection units are oriented to two outer ones of the lateral nozzle insertion holes;

performing double injection using both of said injection units;

moving said moving unit transversely parallel to said stationary platen so that said injection units are moved and positioned in a single injection molding position in which the nozzle of either one of said injection units is oriented to a middle one of the three nozzle insertion holes and in which the other of said injection units is positioned laterally of said three nozzle insertion holes; and



performing single injection molding thereafter using said either one of said injection units.

5,183,622

METHOD FOR FORM-PRESSING WOOD FIBRE PANELS AND FORM PRESSED PANELS, FOR EXAMPLE DOOR SKINS

Göran Persson, Jönköping, Sweden, assignor to Swedoor AB, Sweden

Filed Sep. 21, 1990, Ser. No. 586,497

Claims priority, application Sweden, Sep. 29, 1989, 8903198-3

Int. Cl.[5] B29C *43/00*

U.S. Cl. 264—320 **7 Claims**

1. A method for form-pressing a wood fiber panel having a substantially uniform initial thickness of between about 2 and 6 mm and a density of between about 700 and 900 kg/m^3, said panel containing a binding agent which displays thermoplastic properties during heating, said method comprising the steps of:

preheating said panel so that the wood fibers and the binding agent form a stretchable, self-sustaining composition;

form-pressing said pre-heated composition while still in its self-sustaining condition to a depth of up to about 6 mm by applying pressure which is slowly increased from 0 up to about 30 kg/cm^2 while continuining to supply heat thereto;

interrupting said pressure and heat supply before reaching the elastic limit of said self-sustaining stretchable composition; and allowing said composition to cool.

5,183,623

PROCESS FOR PRODUCING TRANSPARENT AND HEAT-RESISTANT POLYESTER CONTAINERS

Kuniaki Kawaguichi; Toshio Nakane; Akihide Shimoda, and Kenji Hijikata, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Oct. 4, 1991, Ser. No. 770,051

Claims priority, application Japan, Oct. 17, 1990, 2-280259

Int. Cl.[5] B29C *47/88, 51/02, 51/10, 71/02*

U.S. Cl. 264—544 **1 Claim**

1. A process for producing a transparent and heat-resistant container which comprises the steps of:

(a) forming a sheet from a melt of a polyester resin having at least 80 mole % of ester units derived form 1,3-propanediol and terephthalic acid or an ester-forming derivative thereof;

(b) quenching and solidifying the sheet such that the solidified sheet has low crystallinity;

(c) aging said quenched and solidified sheet so as to obtain a low crystallinity sheet; and then

(d) thermoforming the resulting low crystallinity sheet to obtain a container, and wherein

said aging step (a) is conducted at a temperature which satisfies the relationship represented by the following equations (1) and (2):

$$Ta \leqq Tcc \quad (1)$$

$$(\Delta Hcc)a \geqq 5.0 \quad (2)$$

wherein Ta is the aging temperature (° C.), Tcc is the cold crystallization temperature (° C.), and (αHcc)a is the heat of cold crystallization (J/g), said cold crystallization temperature and said heat of cold crystallization each being determined by differential thermal analysis at a rate of temperature increase of 10° C./min; and wherein

said polyester resin satisfies the relationship represented by the following equation (3):

$$Tg + 65 \geqq Tcc \quad (3)$$

wherein Tg is the glass transition temperature (° C.) of the polyester resin as determined by differential thermal analysis at a rate of temperature increase of 10° C./min, and Tcc is as defined previously.

5,183,624

SHUTOFF ASSEMBLY AND IMPROVED DRIVE ROD THEREFOR

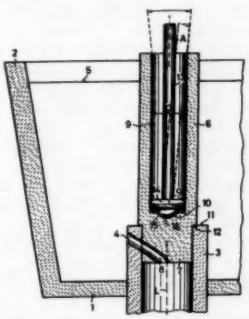
Raimund Brückner, Engenhahn; Ullrich Hintzen, Taunusstein-Watzhahn, both of Fed. Rep. of Germany; Steve Lee, Donbartonshire, Scotland; Andreas Schuler, Taunusstein-Wehen, and Martin Wiesel, Wiesbaden, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Oct. 10, 1991, Ser. No. 774,229

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1990, 4032083

Int. Cl.[5] B22D *41/18*

U.S. Cl. 266—236 **30 Claims**



1. In a shutoff or control assembly for use in regulating the discharge from a metallurgical vessel and including a refractory ceramic rotor member to be coupled to a stator to be rotatable relative thereto to control discharge, and a drive rod separate from said rotor member and having an outer end to be connected to and rotated by a drive unit and an inner end portion extending into said rotor member and having engagement means engaging with an interior portion of said rotor member such that rotation of said drive rod causes rotation of said rotor member, the improvement wherein:

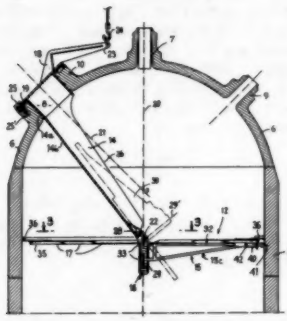
at least said engagement means of said inner end portion of said drive rod is formed of a ceramic material.

5,183,625

REMOVABLE PLATFORM FOR WORKING INSIDE A CASING OF A PRESSURIZER OF A PRESSURIZED-WATER NUCLEAR REACTOR

Michel Batistoni, Dracy le Fort, France, assignor to Famatome, Courbevoie, France

Filed Apr. 2, 1991, Ser. No. 679,228
Claims priority, application France, Apr. 2, 1990, 90 04190
Int. Cl.[5] G21C *17/017*
U.S. Cl. 376—260 8 Claims



1. Removable platform for working inside a casing of a generally cylindrical pressurizer of a pressurized-water nuclear reactor, arranged with its axis vertical and closed at its upper end by a domed bottom through which passes at least one inspection port, said platform being adapted to being installed in said casing and dismounted and extracted by means of operations conducted from outside said casing, said platform comprising

(a) a chute having a handling and fastening assembly at a first end of said chute, consisting of an element for catching on a lifting means, a cylindrical tube and a flange for engaging it into an inspection orifice of said casing and fastening it by screwing of said flange to an outer part of said casing, and a supporting part in a form of a portion of a cylinder open laterally and extending said tube substantially in an axial direction of said tube;

(b) a supporting shaft mounted in an articulated manner at a second end of said chute opposite said first end, said second end being located in the vicinity of an axis of said casing when said chute is installed in said casing, an axis of articulation of said supporting shaft then being in a horizontal position, so that said supporting shaft can pivot between a folded-up position substantially perpendicular to a longitudinal direction of said chute and an operating position in which said support shaft is substantially coaxial relative to said casing;

(c) an assembly of supporting arms mounted on said supporting shaft for pivoting movement between a folded-up position in which said supporting arms are substantially parallel to and laid against one another, said supporting arms then being capable of being placed and maintained in said chute in its axial direction, said supporting shaft being in its folded-up position, and an unfolded position in which said arms (15), by pivoting about said axis of said supporting shaft in vertical position, can be placed in angular arrangements distributed substantially uniformly about said axis (20) of said casing (2); and

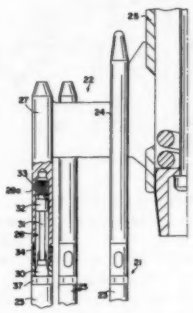
(d) a plurality of plane elements intended for resting on said supporting arms in unfolded position, to form a work platform over substantially an entire cross-section of said casing (2).

5,183,626

CONTROL CLUSTER INCLUDING DEMOUNTABLE FUEL FOR A NUCLEAR FUEL ASSEMBLY

Jean-Pierre Denizou, Craponne, France, assignor to Framatome, Courbevoie and Cogema, Velizy Villacoublay, both of, France

Filed Jun. 28, 1989, Ser. No. 372,494
Claims priority, application France, Jun. 28, 1988, 88 08674
Int. Cl.[5] G21C *7/10*
U.S. Cl. 376—327 4 Claims



1. Control cluster including demountable cylindrical rods comprising a crosspiece constituted by a plurality of fins disposed angularly in relation to one another and each comprising at least one protective tube having a blind bore which is internally threaded over a part of its length, an axis of said bore extending in a longitudinal direction of said control cluster, as well as a set of cylindrical rods each comprising an active part and an end part adapted to be engaged and fixed in said bore of a said protective tube and comprising, in an axial extension of a plug for closing said active part, a connecting part which is threaded over a part of its length to enable screwing of said rod into the bore of a corresponding protective tube, wherein, for each one of said demountable rods:

(a) the end part of said protective tube is open towards the exterior and comprises a reduced external diameter part over a certain length and at least one seat on a wall of said protective tube for seating said rod, and openings through its wall in said reduced diameter part;

(b) said end part of said rod is integral with a ferrule which is coaxial with said rod and which surrounds said connecting part of said rod over a portion of its length corresponding to said portion engaged in said reduced diameter part of said protective tube, said ferrule having an internal diameter substantially equal to said reduced diameter of said protective tube and being engaged on said reduced diameter part of the protective tube;

(c) a prismatic engagement surface is provided on said external surface of said rod; and

(d) said rod is locked in said protective tube by deformed parts of said ferrule housed within said openings of said end part of said protective tube.

5,183,627

NUCLEAR REACTOR WITH LOW-LEVEL CORE COOLANT INTAKE

Roy C. Challberg, Livermore, and Harold E. Townsend, Campbell, both of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Nov. 27, 1991, Ser. No. 798,789
Int. Cl.[5] G21C *15/00*
U.S. Cl. 376—352 5 Claims

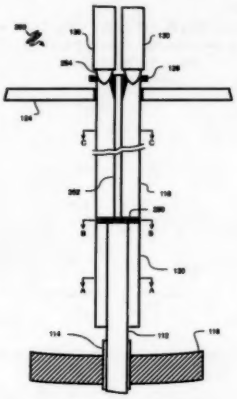
1. A reactor comprising:

a reactor vessel having a bottom, a sidewall, and a top;

a core within said reactor vessel;

control rod guide tubes for guiding vertical movement of controls rods relative to said core;

control rod drive housings extending between said vessel bottom and respective ones of said control rod guide tubes; and



channel means for defining annular channels about said control rod drive housings, said channels having entrances within 25 centimeters of said vessel bottom and having exits providing for fluid communication with said control rod guide tubes.

5,183,628

NUCLEAR REACTOR INTERNALS WITH CLUSTER GUIDES

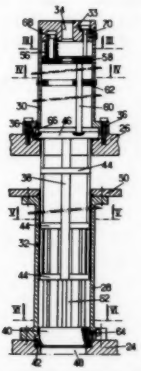
Jacques Baujat, Versailles, and Gérard Chevereau, Le Raincy, both of France, assignors to Framatome, Courbevoie, France

Filed May 6, 1991, Ser. No. 695,907

Claims priority, application France, May 7, 1990, 90 05729

Int. Cl.[5] G21C *1/04*

U.S. Cl. 376—353 **8 Claims**



1. In a nuclear reactor having a core, internals mounted over said core, comprising: a lower plate provided with openings for coolant leaving the core; an upper plate; a plurality of support columns mutually connecting the plates; and a plurality of guides for vertically movable control clusters each of which comprises a plurality of parallel control rods, wherein each of said guides has an upper section securely fixed to the upper plate and a lower section extending between the upper and lower plates, wherein the lower section of each said guide has a base bearing on a respective frusto-conical bearing surface of a seat which is fast with said lower plate and wherein said lower section is subjected to the downward force of resilient means biasing said base onto said seat.

5,183,629

ADDITIONAL GRID FOR A NUCLEAR REACTOR FUEL ASSEMBLY, AND ASSEMBLY COMPRISING AN APPLICATION THEREOF

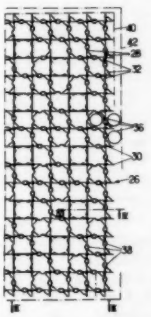
Jean-Noël Canat, Lyons, and Régis Mortgat, Couzon au Mont d'Or, both of France, assignors to Framatome, Courbevoie and Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, both of, France

Filed Jul. 24, 1991, Ser. No. 735,251

Claims priority, application France, Jul. 24, 1990, 90 09447

Int. Cl.[5] G21C *3/34*

U.S. Cl. 376—439 **11 Claims**



1. Coolant mixing grid for a nuclear fuel assembly for location between grids constituting structural parts of said fuel assembly, said mixing grid being devoid of a belt and comprising at least two crossed sets of mutually parallel plates fixed to each other at cross-points of said plates, said plates being provided with coolant stirring fins and defining cells, some of said cells receiving guide tubes and others of said cells receiving fuel rods, each of said plates being provided, on each of faces of each of said cells receiving fuel rods, with bosses projecting radially inwardly into a said cell by an amount which is sufficiently small to leave radial clearance for a respective fuel rod passing through said cell, and an amount of projection of said bosses being proportioned relative to projection of said fins, so that in case of bending vibration the respective rod comes into contact with said bosses without reaching said fins, lengths of individual said plates being such that a footprint of said grid is less than a polygon constituting a virtual envelope of said rods.

5,183,630

PROCESS FOR PRODUCTION OF PERMANENT MAGNET ALLOY HAVING IMPROVED RESISTENCE TO OXIDATION

Toshio Ueda; Yuichi Sato; Masayasu Senda; Seiji Isoyama, and Seiichi Hisano, all of Tokyo, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Division of Ser. No. 565,452, Aug. 9, 1990. This application Jun. 4, 1991, Ser. No. 710,800

Claims priority, application Japan, Aug. 25, 1989, 1-217500; Aug. 25, 1989, 1-217501; Nov. 22, 1989, 1-301907; Nov. 22, 1989, 1-301908

Int. Cl.[5] B22F *1/02*

U.S. Cl. 419—31 **46 Claims**

1. In a process for producing a permanent magnet alloy based on a R—Fe—B—C system where R is at least one of the rare earth elements including Y, comprising the steps of preparing a molten crude alloy, producing a powder directly

therefrom or by casting it into an alloy ingot and then grinding it into the powder, compacting the thus obtained powder and sintering the compacted product, the improvement comprising the ingot or powder of the alloy before being sent to the compacting step being subjected to a heat treatment which is carried out at a temperature of 500°–1,100° C. for a period of up to 24 hours so as to produce a permanent magnet alloy based on a R—Fe—B—C system whose individual magnetic crystal grains are covered with an oxidation-resistant protective film which has a C content of 0.05–16 wt % and higher than that of said individual crystal grains and wherein the composition of said magnet alloy as the sum of the magnetic crystal grains and the oxidation-resistant protective film comprises 10–30% R, less than 2%, not inclusive of zero percent, of B, 0.1–20% C, all percentages being on an atomic basis, with the balance being Fe and incidental impurities.

5,183,631

COMPOSITE MATERIAL AND A METHOD FOR PRODUCING THE SAME

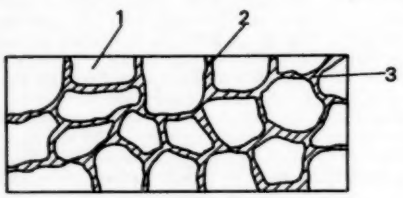
Koichi Kugimiya; Yasuhiro Sugaya; Osamu Inoue; Mitsuo Satomi, and Ken Hirota, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 8, 1990, Ser. No. 535,080

Claims priority, application Japan, Jun. 9, 1989, 1-147902; Jul. 7, 1989, 1-175901; Jul. 19, 1989, 1-186488; Sep. 28, 1989, 1-253321; Oct. 26, 1989, 1-280554; Nov. 6, 1989, 1-288356; Nov. 6, 1989, 1-288358; Nov. 6, 1989, 1-288359; Nov. 6, 1989, 1-288360; Jan. 12, 1990, 2-4980; Mar. 26, 1990, 2-76062; Apr. 18, 1990, 2-101934

Int. Cl.[5] B22F *1/02*

U.S. Cl. 419—10 **14 Claims**



1. A method for producing a composite material with a resistivity of at least 10 ohm-cm, comprising the steps of:

providing grains made of a first substance, said first substance comprising at least one of a metal and an alloy thereof;

forming a thin coating film on the surface of said grains to prepare coated grains, said thin coating film being made of a second dielectric substance and having a mean thickness smaller than the mean particle size of said grains, said second dielectric substance comprising an inorganic material;

compacting said coated grains into a green body; and

densifying said green body in an active gas atmosphere, while forming an additional thin coating film on the surface of said grains, said additional thin coating film being made of the second dielectric substance or a third dielectric substance and having a mean thickness smaller than the mean particle size of said grains.

5,183,632

METHOD OF MANUFACTURING AN ALUMINUM-BASE COMPOSITE DISC ROTOR

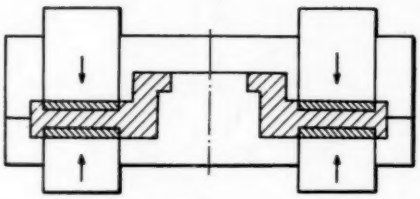
Manabu Kiuchi, Zushi, and Masao Arai, Kumagaya, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Hanyu, both of, Japan

Filed Mar. 3, 1992, Ser. No. 845,194

Claims priority, application Japan, Mar. 20, 1991, 3-81814

Int. Cl.[5] B22F *3/14*

U.S. Cl. 419—48 **4 Claims**



1. A method of manufacturing an aluminum-base composite disc rotor comprising:

i) preparing a rough-shaped disc rotor made of a mixture of aluminum powder or aluminum alloy powder with reinforcing particles;

ii) placing a mixture of aluminum powder or aluminum alloy powder with reinforcing particles on each of the fixed positions of said rough-shaped disc rotor;

iii) heating said mixture to at least a region of mashy state temperature; and

iv) molding said mixture under pressure.

5,183,633

STEEL HAVING IMPROVED WELDABILITY AND METHOD THEREOF

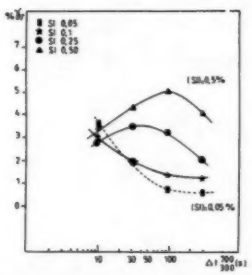
Maurickx Thierry, Dunkerque; Verrier Pascal, Lumbres, and Taillard Roland, Villeneuve D'Asco, all of France, assignors to Sollac, Puteaux, France

Filed Oct. 9, 1991, Ser. No. 773,434

Claims priority, application France, Oct. 18, 1990, 90 12916

Int. Cl.[5] C22C *38/12*

U.S. Cl. 420—92 **4 Claims**



1. Steel having improved weldability, comprising, by weight;

0.07 to 0.11% carbon,

1.40 to 1.70% manganese,

0.20 to 0.55% nickel,

0 to 0.30% copper,

0 to 0.02 niobium,

0.005 to 0.20% titanium,

0.002 to 0.006% nitrogen,

0 to 0.15% silicon,

the balance being iron.

5,183,634

HIGH STRENGTH SPRING STEEL

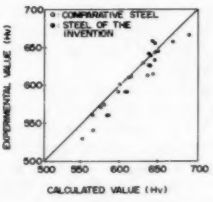
Tsuyoshi Abe, Chiba; Nobumasa Umezawa, Funabashi; Tatsuo Fukuzumi, Tokyo; Katsuyuki Uchibori, Chiba; Junji Ozaki, Tokyo, and Hiroharu Motomura, Ichihara, all of Japan, assignors to Mitsubishi Steel Mfg. Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1991, Ser. No. 805,202

Claims priority, application Japan, Feb. 22, 1991, 3-48766; Jun. 19, 1991, 3-147460

Int. Cl.[5] C22C *38/22, 38/24*

U.S. Cl. 420—110 1 Claim



1. A high strength spring steel consisting of, in weight percentage, 0.50 to 0.70% C, 1.00 to 2.50% Si, 0.30 to 1.20% Mn, 0.80 to less than 1.20% Cr, 0.05 to 0.30% Mo, 0.05 to 0.30% V, 0.01 to 0.30% Nb, 0.005 to 0.100% Al and the balance being Fe and unavoidable impurities.

5,183,635

HEAT TREATABLE TI-AL-NB-SI ALLOY FOR GAS TURBINE ENGINE

Stephen Kerry, Fleet, England; James E. Restall, deceased, late of Camberley, England by Janet E. Restall, executrix , and Michael I. Wood, Dorking, England, assignors to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB88/00624, § 371 Date Feb. 25, 1990, § 102(e) Date Feb. 25, 1990, PCT Pub. No. WO89/01052, PCT Pub. Date Feb. 9, 1989

PCT Filed Jul. 28, 1988, Ser. No. 465,120

Claims priority, application United Kingdom, Jul. 31, 1987, 8718192

Int. Cl.[5] C22C *14/00*

U.S. Cl. 420—420 10 Claims

1. A heat-treatable titanium alloy which is suitable for use as components in the compressor section of a gas turbine engine and which is based on or contains the intermetallic phase Ti_3Al, consisting essentially of the following constituents in atomic proportions:

20 to 23% aluminum
9 to 15% niobium
0.5 to 1.0% silicon
0 to 3% zirconium
0 to 3% vanadium
0 to 3% molybdenum
balance essentially titanium;

and wherein the proportion of optional constituents from the group consisting of zirconium, vanadium and molybdenum, when two or more are present in combination, is up to 5 atomic percent.

5,183,636

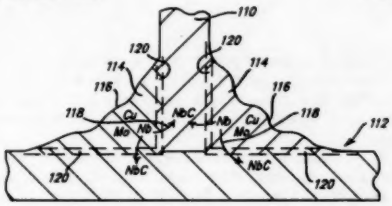
BRAZE FILLER METAL WITH ENHANCED CORROSION RESISTANCE

Samuel C. DuBois, Troy, Mich., assignor to Wall Colmonoy Corporation, Madison Heights, Mich.

Filed Jul. 1, 1991, Ser. No. 723,943

Int. Cl.[5] C22C *19/05*

U.S. Cl. 420—442 7 Claims



1. A braze filler metal composition exhibiting corrosion resistance both at the boundary layer between the base metal and the filler metal and in the filler metal fillet which is substantially iron free in its composition, said composition consisting essentially of:

a nickel based alloy including from about 5% to about 9% chromium; from about 3.5% to about 5.5% silicon; from about 2.0% to about 4.0% boron and containing effective amounts of: a) from about 2% to about 12% of a fillet metal corrosion inhibiter for protecting the fillet metal from corrosion due to the diffusion of iron from the base metal into the filler metal fillet during brazing, said inhibiter being selected from the group consisting of copper molybdenum and mixtures thereof, said alloy containing at least 1% of copper; and b) from about 1% to about 6% of a diffusing carbide forming base metal protector having a higher affinity for forming carbides than chromium, said protector being for diffusion into the base metal for preferentially forming carbides which might otherwise form chromium carbides from chromium in the base metal thereby substantially reducing chromium carbide formation at the grain boundaries in the base metal and at the diffusion layer, said diffusing carbide forming base metal prohibitor selected from the group consisting of niobium, tantalum and mixtures thereof wherein said composition is substantially free of iron.

5,183,637

WEAR RESISTANT COPPER ALLOYS

Tadashi Tanaka, Konan; Masaaki Sakamoto, Nagoya; Koichi Yamamoto, Komaki, and Tohru Kato, Seto, all of Japan, assignors to Daido Metal Company Ltd., Nagoya, Japan

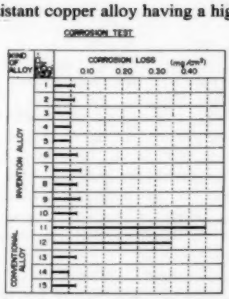
Filed Feb. 6, 1992, Ser. No. 832,124

Claims priority, application Japan, Feb. 7, 1991, 3-016539

Int. Cl.[5] C22C *30/00, 5/06*

U.S. Cl. 420—479 6 Claims

1. A wear-resistant copper alloy having a high strength and



high toughness comprising, by weight, 1.2 to 8.5% Mn, 0.3 to

2.5% Si, 3.0 to 8.0% Al, 20 to 40% Zn, and the balance of Cu and unavoidable impurities, said alloy further comprising 0.05 to 1.5% by weight of Te for an improvement in anti-seizure property.

5,183,638

AUTOMATIC IMMUNITY ANALYSIS APPARATUS WITH MAGNETIC PARTICLE SEPARATION

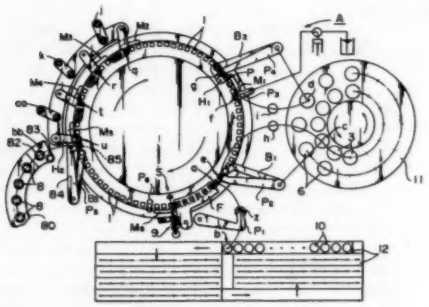
Koichi Wakatake, Tokyo, Japan, assignor to Kabushiki Kaisha Nittec and Mitsui Pharmaceuticals, Inc., both of Tokyo, Japan

Filed Dec. 3, 1990, Ser. No. 620,608

Claims priority, application Japan, Dec. 4, 1989, 1-313363; Jan. 19, 1990, 2-3063; Jan. 24, 1990, 2-4633; Jan. 24, 1990, 2-4634; Mar. 16, 1990, 2-26198

Int. Cl.[5] G01N *21/01, 21/11;* **B01F** *11/00*

U.S. Cl. 422—64 **4 Claims**



1. An automatic immunity analysis apparatus comprising reaction vessels arranged in a series, a conveying means for said reaction vessels, a first dividing means for sucking a sample in a predetermined quantity at a predetermined position and dividing and charging said sample into each of said reaction vessels, a first agitating means for dividing, charging and agitating an antibody insoluble magnetic solution into each of said reaction vessels containing said sample divided and charged, a second dividing means which is positioned after said first agitating means, said second dividing means for dividing and charging a stroma solution into each of said vessels, a first adsorbing means for adsorbing said antibody insoluble magnetic solution onto an inner wall surface of each of said reaction vessels, a first cleaning means for discarding a reactions solution out of each of said reaction vessels while said antibody insoluble magnetic solution is still adsorbed on the inner wall of each of said reaction vessels and then cleaning each of said vessels, a second agitating means for dividing and agitating an enzyme labeling antibody solution, a second absorbing means for adsorbing said antibody insoluble magnetic solution onto an inner wall surface of each of said reaction vessels, a second cleaning means for discarding a reaction solution out of each of said reaction vessels while said antibody insoluble magnetic solution is still adsorbed on the inner wall of each of said reaction vessels and then cleaning each of said vessels, a third dividing means for dividing and charging a reaction stop solution, a measuring means for optically measuring a sample in each of said reaction vessels at an optical measuring position, and a third cleaning means for cleaning the inside of each of said reaction vessels after completion of a measurement, wherein said first dividing means, said first agitating means, said second dividing means, said first adsorbing means, said first cleaning means, said second agitating means, said second absorbing means, said second cleaning means, said third dividing means, said measuring means and said third cleaning means are arranged sequentially beginning with said first dividing means and ending with said third cleaning means on said conveying means in said automatic immunity analysis apparatus, wherein

said first agitating means further comprises a reagent vessel holder which is rotated by means of a driving apparatus, a rotating body which is engaged with a retention hole of said reagent vessel holder in a freely rotatable manner and has an aperture in a side surface, a fixed gear body having a first peripheral surface of which gear teeth are cut thereon, said fixed gear body mounted on said reagent vessel holder, a gear body which engages with the gear teeth of said fixed gear body and drives said rotating body when said reagent vessel holder rotates, said fixed gear body further including protrusion bodies which are elevated in predetermined intervals along a second peripheral surface of said fixed gear body, said protrusion bodies extending through said aperture during driving of said rotation body, wherein

an antibody insoluble magnetic solution accommodated in said rotating body is rotated and agitated when said reagent vessel holder revolves, and accommodated in said rotating body in such a manner that said reagent antibody insoluble magnetic solution is shaken and agitated by one of said protrusion bodies extending through said aperture.

5,183,639

Patent Not Issued For This Number

5,183,640

APPARATUS FOR PRODUCING RUBBER MIXTURES

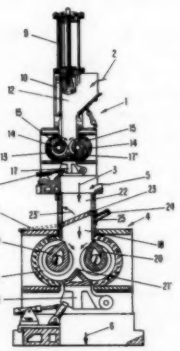
Julius Peter, Dommayergasse 7, A-1130 Vienna, Austria, and Günter Weckerle, Northeim, Fed. Rep. of Germany, assignors to Continental Aktiengesellschaft, Hanover, Fed. Rep. of Germany and Julius Peter, Vienna, Austria

Filed Aug. 28, 1991, Ser. No. 751,151

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1990, 4027261

Int. Cl.[5] C08F *6/00;* **B28C** *7/16*

U.S. Cl. 422—135 **12 Claims**



1. An apparatus for producing rubber mixtures, comprising:

a master batcher, comprising a ram kneader that operates in a batch process;

a ram-less final mixer that is disposed below said ram kneader, also operates in a batch process, and has a greater volume capacity than does said ram kneader, with said final mixer having a mixing chamber that is provided with rotors;

an at least substantially vertically disposed transfer channel that interconnects said ram kneader to said final mixer and serves for the transfer of a master batch from said ram kneader to said mixing chamber of said final mixer;

at least one exhaust opening disposed above said mixing chamber of said final mixer in wall means of at least one of said transfer channel and said mixing chamber of said final mixer; and

means for sealingly closing off said transfer channel above said at least one exhaust opening.

5,183,641

DISTRIBUTOR PLATE IN A FLUIDIZED BED REACTOR

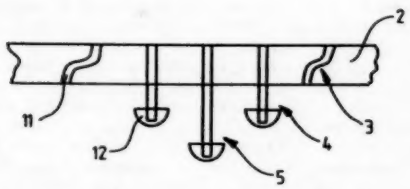
Juhani Isaksson, Karhula, Finland, assignor to A. Ahlstrom Corporation, Karhula, Finland

Division of Ser. No. 232,774, Aug. 16, 1988. This application Sep. 26, 1990, Ser. No. 578,420

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.[5] F23D *1/00*; F27B *15/02*; B01J *8/18*

U.S. Cl. 422—143 **22 Claims**



14. A method of starting up a fluidized bed reactor having a reaction chamber, a wind box, a grid plate at an interface therebetween and a first and second sets of nozzles through the grid plate each for flowing fluidizing gas from the wind box and substantially evenly distributing the fluidizing gas across said grid plate and into the reaction chamber, comprising the steps of providing particulate bed material inside said first set of nozzles and establishing at least in part a first predetermined pressure drop across said first set of nozzles before fluidizing gas may flow therethrough, initiating flow of fluidizing gas from the wind box into said reaction chamber through the said first set of nozzles at said first predetermined pressure drop across the grid plate sufficient to blow the particulate bed material out of said first set of nozzles, providing particulate bed material inside said second set of nozzles, and establishing at least in part a second predetermined pressure drop across said second set of nozzles before gas may flow therethrough, and initiating the flow of fluidizing gas through said second set of said nozzles from the wind box into said reaction chamber at said second predetermined pressure drop across the grid plate higher than said first predetermined pressure drop and sufficient to blow the particulate bed material out of said second set of nozzles, whereby, at reactor start-up, fluidizing gas flows through said first set of nozzles before flowing through said second set of nozzles.

5,183,642

INSTALLATION FOR STEAM CRACKING HYDROCARBONS, WITH SOLID EROSIVE PARTICLES BEING RECYCLED

Eric Lenglet, Marly le Roi, France, assignor to Procedes Petroliers et Petrochimiques, Marly Le Roi, France, a part interest

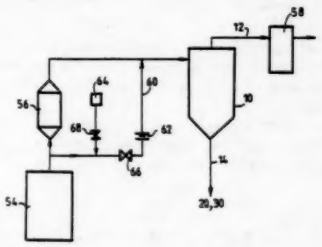
PCT No. PCT/FR90/00711, § 371 Date May 30, 1991, § 102(e) Date May 30, 1991, PCT Pub. No. WO91/05031, PCT Pub. Date Apr. 18, 1991

PCT Filed Oct. 5, 1990, Ser. No. 700,196

Claims priority, application France, Oct. 6, 1989, 89 13070

Int. Cl.[5] B01J *8/08*; C01G *9/36*

U.S. Cl. 422—213 **21 Claims**



1. A hydrocarbon steam cracking installation comprising at least one furnace for cracking hydrocarbons, an indirect quench heat exchanger connected to said furnace for receiving effluent leaving the furnace, direct quench means, an effluent duct connecting said indirect quench heat exchanger to said direct quench means, a particle injection duct cooperating with said at least one furnace for injecting solid particles into said furnace, a separator connected between said indirect quench heat exchanger and said direct quench means for separating solid particles from the gaseous effluent passing from said indirect quench heat exchanger to said direct quench means, said separator including a solids outlet for discharge of solid particles collected by the separator, a tank for storing solid particles, said tank having an inlet connected to said solids outlet of said separator and having an outlet connected to said particle injection duct whereby solid particles may be introduced into said duct, a source of gas under pressure connected to said particle injection duct, and a conduit also connecting said source of gas under pressure to said tank for increasing the inside pressure of said tank to a value that is not less than the pressure in said particle injection duct.

5,183,643

MEDICAL INSTRUMENT STERILIZATION CONTAINER

Robert L. Nichols, 4555 N. Jackson, Jacksonville, Tex. 75766

Continuation of Ser. No. 477,594, Feb. 9, 1990, abandoned, which is a continuation of Ser. No. 335,361, Apr. 10, 1989, Pat. No. 4,900,519, which is a continuation of Ser. No. 208,730, Jun. 17, 1988, Pat. No. 4,915,918, which is a continuation of Ser. No. 821,136, Jan. 22, 1986, Pat. No. 4,752,453, which is a division of Ser. No. 668,090, Nov. 5, 1984, Pat. No. 4,617.178. This application Sep. 17, 1991, Ser. No. 762,060

The portion of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[5] A61L *2/26*

U.S. Cl. 422—297 **3 Claims**

1. A sterilization container for use in connection with the sterilization of medical instruments, said sterilization container comprising:

a tray for supporting medical instruments;

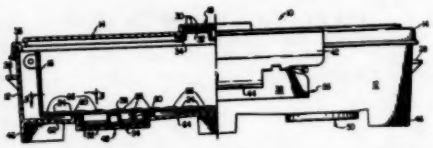
a housing having a bottom and side walls for receiving said tray;

a lid having edges and a raised portion spaced from said edges, said lid adapted to form a sealing arrangement with said housing;

an aperture through said raised portion of said lid;

a first filter, disposed in said aperture, for allowing the passage of sterilizing gases therethrough while preventing the passage of contaminants;

said housing bottom sloping to at least one location, said location having an opening to drain said condensate from



said housing, said opening being laterally spaced from said aperture, when said lid is sealed over said housing, such that an axis of said aperture is spaced apart from said opening; and

a second filter, disposed in said opening, for passing said condensate and said gases therethrough but inhibiting passage of said contaminants into said housing.

5,183,644

APPARATUS FOR TREATING PACKAGE CONTAINER BLANKS

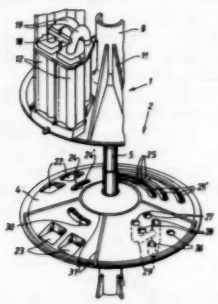
Lars Martensson, Veberod, and Jan Andersson, Ystad, both of Sweden, assignors to Tetra Alfa Holdings SA, Pully, Switzerland

Filed Apr. 16, 1991, Ser. No. 686,154

Claims priority, application Sweden, Apr. 27, 1990, 9001534

Int. Cl.[5] A61L *2/00*; **B08B** *3/00*; **B65B** *55/04*

U.S. Cl. 422—304 **16 Claims**



1. An apparatus for treating package container blanks with a fluid, comprising: a rotary portion mounted for rotation about a drive shaft and having a chamber mounted thereon for receiving a package container blank, and a fixed portion extending around said drive shaft and having a stator surface that faces the rotary portion, said rotary portion being rotatable relative to said fixed portion and said rotary portion having a rotor surface that faces said fixed portion, said rotor surface and said stator surface being substantially conical, said fixed portion having a first inlet channel formed therein, conduit means in said rotary portion for interconnecting said first inlet channel and said chamber at a first rotary position of said rotary portion, said fixed portion having an infeed aperture opening to the stator surface, said chamber being aligned with said infeed aperture when said rotary portion is in a second rotary position so that container blanks may be inserted into said chamber through said infeed aperture when said rotary portion is in the second rotary position and fluid may be supplied through said conduit means to said chamber upon rotation of said rotary portion to said first rotary position.

5,183,645

METHOD FOR RECOVERING WITH THE AID OF A CROWN COMPOUND PLUTONIUM (IV) PRESENT IN SOLUTIONS, SUCH AS AQUEOUS EFFLUENTS, CONCENTRATED SOLUTIONS OF FISSION PRODUCTS AND CONCENTRATED SOLUTIONS OF PLUTONIUM

Jacques Foos, Orsay; Marc Lemaire, Villeurbanne; Alain Guy, Pontcarre; Vincent Guyon, Paris; Rodolphe Chomel, Orange; André Deloge; Pierre Doutreluigne, both of Bagnols/Céze, and Henri Le Roy, Equeurdreville, all of France, assignors to Cogema-Compagnie Generale des Matieres Nucleaires, Velizy Villacoublay, France

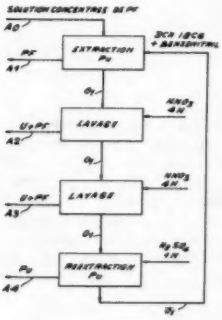
Filed Dec. 11, 1990, Ser. No. 625,550

Claims priority, application France, Dec. 15, 1989, 89 16639

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] B01D *11/04*

U.S. Cl. 423—8 **9 Claims**



1. Method to recover plutonium (IV) from a first aqueous solution constituted by either a concentrated solution of fission products derived from the first cycle for reprocessing irradiated nuclear fuels or by an aqueous effluent derived from an irradiated nuclear fuels reprocessing installation or by a concentrated solution of plutonium containing americium, comprising the steps of:

a) placing the first aqueous solution in contact with an organic solution including at least one crown compound so as to extract plutonium from the first aqueous solution and to obtain an organic solution containing plutonium,

b) washing the organic solution containing plutonium with one or more portions of a second aqueous solution of nitric acid,

c) re-extracting the plutonium from the organic solution into a third aqueous solution.

5,183,646

INCINERATOR FOR COMPLETE OXIDATION OF IMPURITIES IN A GAS STREAM

Lawrence B. Anderson, Encinitas; Timothy E. Hammon, Cardiff, and Cliff Frieler, Highland Park, all of Calif., assignors to Custom Engineered Materials, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 486,617, Feb. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 355,987, May 22, 1989, abandoned, and a continuation-in-part of Ser. No. 336,718, May 12, 1989, abandoned. This application Feb. 28, 1991, Ser. No. 662,124

Int. Cl.[5] B01D *53/34*; **F01N** *3/26*; **F23D** *14/66, 14/84*

U.S. Cl. 423—210 **26 Claims**

1. A device for oxidizing materials in a gas stream, comprising:

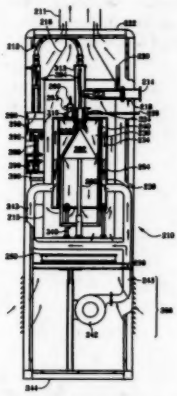
a combustion chamber in said device, said device and said combustion chamber both having a top and a bottom, said device further having a gas outlet and being adapted to

operate in conjunction with means applying negative pressure to said outlet;

means for introducing process gas and a source of fuel into the top of said combustion chamber;

means for introducing oxygen carrying gas into the top of said combustion chamber;

means for mixing said oxygen carrying gas with said process



gas and fuel so that said mixture can burn in said combustion chamber to form an exhaust gas;

means for directing said mixture outwardly toward the wall of said combustion chamber as it is burning;

means for permitting said gas to exit from the bottom of said combustion chamber; and

means for directing said gas from said combustion chamber out of the outlet of said device.

5,183,647

METHOD FOR PURIFYING NITROGEN TRIFLUORIDE GAS

Isao Harada; Hisashi Hokonohara, and Toshiaki Yamaguchi, all of Yamaguchi, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP89/01038, § 371 Date May 28, 1991, § 102(e) Date May 28, 1991, PCT Pub. No. WO91/04942, PCT Pub. Date Apr. 18, 1991

PCT Filed Oct. 9, 1989, Ser. No. 689,941

The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.

Int. Cl.[5] C01B *9/08*

U.S. Cl. 423—239 **14 Claims**

7. A method for purifying nitrogen trifluoride gas containing at least dinitrogen difluoride as impurities which comprises:

a. providing a vessel at least the inner wall of which is composed of nickel;

b. then forming a film of nickel fluoride by bringing at least fluorine gas into contact for 10 minutes to 15 hours with the nickel inner wall of the vessel, the vessel being heated to about 30° to 200° C., said at least fluorine gas contacting the nickel inner wall first having a low F_2 gas concentration and then being enhanced to finally having a 100 percent content of F_2 gas;

c. then packing the vessel with a solid fluoride, the nickel inner wall of the vessel being covered with the nickel fluoride film, to form a packed bed;

d. then heating the nitrogen trifluoride gas in the packed bed at 150° to 600° C., and

e. then heating the nickel fluoride film at 400° to 800° C. in an inert atmosphere.

5,183,648

PROCESS FOR PREPARING MAGNESIA HAVING REDUCED HYDRATION TENDENCY, HYDRATION RESISTANT MAGNESIA, DRY MIXTURE FOR PREPARING MAGNESIA BASED CASTABLES AND MAGNESIA BASED CASTABLE

Anthony J. Wolfert, Arnhem, Netherlands, assignor to Shell Research Limited, United Kingdom

Filed Mar. 8, 1991, Ser. No. 665,794

Claims priority, application United Kingdom, Mar. 15, 1990, 9005815

Int. Cl.[5] C01F *5/02*

U.S. Cl. 423—267 **9 Claims**

1. A process for preparing magnesia having a reduced hydration tendency, comprising contacting particles of refractory grade magnesia with a 0.01M to 5M solution of an inorganic acid or salt thereof, recovering the treated magnesia, and drying the treated magnesia.

5,183,649

PRODUCTION OF PHOSPHORUS COMPOUNDS

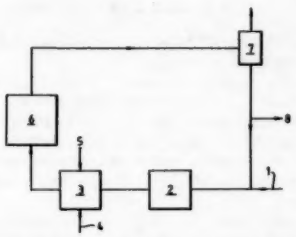
William S. Holmes, Compton, and Robert Marshall, Stourbridge, both of England, assignors to Albright & Wilson Ltd., Warley, England

Filed Apr. 11, 1991, Ser. No. 684,044

Claims priority, application United Kingdom, Apr. 12, 1990, 9008422

Int. Cl.[5] C01B *25/10*

U.S. Cl. 423—300 **23 Claims**



1. A process for the production of a chlorophosphorus compound selected from the group consisting of phosphorus trichloride and a mixture of phosphorus trichloride and phosphorus oxychloride, said process comprising:

(i) recycling a liquid medium comprising said chlorophosphorus compound and adding yellow phosphorus thereto to form a condensed phase mixture of phosphorus in said liquid medium,

(ii) inputting into said condensed phase mixture under conditions of highly-turbulent flow a gas selected from the group consisting of chlorine and a mixture of chlorine and oxygen, such that the atomic ratio of oxygen to phosphorus is less than 1:1 to form a reaction mixture, said highly-turbulent flow resulting in an apparent Reynolds number of at least 2000 and being at (a) the points of contact of said reaction mixture and said gas and (b) thereafter in a reaction zone, whereby a reaction material comprising said chlorophosphorus compound and elemental phosphorus is produced, wherein (1) the overall atomic ratio of inputted chlorine to added phosphorus is 3:1 or less and the atomic ratio of inputted oxygen to added phosphorus in the condensed phase mixture is zero to produce phosphorus trichloride, or (2) the atomic ratio of inputted oxygen to added phosphorus in the condensed phase mixture is 0.1:1 to 0.98:1 and the atomic ratio of inputted chlorine to inputted oxygen is 3:1 to 10.1 to produce a mixture of phosphorus oxychloride and phosphorus trichloride,

(iii) cooling said reaction material and,

(iv) recycling at least a portion of said reaction material to (i)

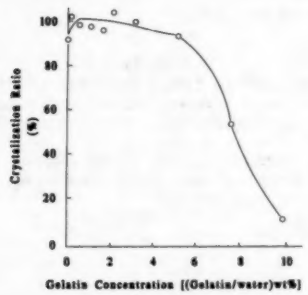
as said liquid medium for mixing with additional yellow phosphorus.

5,183,650

MICRO-PARTICULATE ALUMINOSILICATE AND PROCESS FOR PRODUCING THE SAME

Yoshiaki Goto, Otsu, and Kozo Arai, Kiryu, both of Japan, assignors to Tokushu Kika Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 17, 1991, Ser. No. 686,517
Int. Cl.[5] C01B *33/34*
U.S. Cl. 423—710 3 Claims



1. A process for producing a micro-particulate aluminosilicate, comprising the steps of:

preparing an aqueous solution as a solvent, said aqueous solution containing gelatin dissolved therein;

adding to said aqueous solution a metal hydroxide or a metal salt, a metal aluminate and colloidal silica as essential components and stirring the mixture to uniformly disperse said essential components and allow the mixture to mature; and

heating said mixture to synthesize said micro-particulate aluminosilicate.

5,183,651

PROCESS FOR THE PREPARATION OF CRYSTALLINE SODIUM SILICATES

Günther Schimmel; Michael Kotzian, and Reinhard Gradl, all of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 28, 1990, Ser. No. 635,933
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1990, 4000705
Int. Cl.[5] C01B *33/32*
U.S. Cl. 423—334 3 Claims

1. A process for the preparation of crystalline sodium silicates having a layer structure and the formula $Na_2Si_xO_{2x+1}$ in which x is between 2 and 3 consisting of the steps:

a) fusing sand and soda in a molar ratio of SiO_2/Na_2O of 2 to 3.5 at temperatures of 1200° to 1400° C. with the resultant formation, after cooling the melt, of a lumpy water glass;

b) grinding the lumpy water glass to a particle size of less than 2 mm;

c) treating the ground water glass at temperatures of 600° to 800° C. for 10 to 120 minutes in an elongated reaction zone with mechanical circulation; and

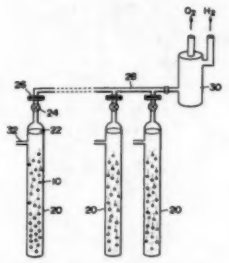
d) grinding the material leaving the reaction zone to a particle fineness of less than 1 mm.

5,183,652

RADIOACTIVE CATALYST AND OXIDATION-REDUCTION METHOD AND APPARATUS USING SAME

Nobuyuki Sasao, Naka, and Yukio Wada, Mito, both of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Division of Ser. No. 631,998, Dec. 21, 1990, Pat. No. 5,093,302, which is a continuation-in-part of Ser. No. 404,966, Sep. 8, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 773,121
Claims priority, application Japan, Oct. 1, 1988, 63-248755
Int. Cl.[5] C01B *3/04, 13/02*
U.S. Cl. 423—579 4 Claims



1. An oxidation-reduction method comprising providing a radioactive catalyst comprising a fine particle of semiconductor having a particle size of 0.1 to 10 μm, and a radioactive platinum group element, which generates radiation energy of about 10^5 to about 10^6 eV, deposited on said particle of semiconductor, whereby said radioactive catalyst can serve as a source of radiation and also as a catalyst for an oxidation-reduction reaction; bringing the radioactive catalyst into contact with a fluid to be processed to produce electron-hole pairs in the semiconductor of said catalyst by radiation generated from said radioactive platinum group element deposited on said semiconductor particle; and thereby causing an oxidation-reduction reaction.

3. An oxidation-reduction apparatus comprising a container packed with a radioactive catalyst comprising a fine particle of semiconductor having a particle size of 0.1 to 10 μm, and a radioactive platinum group element, which generates radiation energy of about 10^5 to about 10^6 eV, deposited on said particle of semiconductor, whereby said radioactive catalyst can serve as a source of radiation and also as a catalyst for an oxidation-reduction reaction; means for supplying a fluid to be processed into said container; and means for discharging products of oxidation-reduction reaction from said container.

5,183,653

BORONIC ACID ADDUCTS OF METAL DIOXIME COMPLEXES USEFUL IN LABELLING PROTEINS AND OTHER AMINE-CONTAINING COMPOUNDS

Karen E. Linder, Highland Park; Adrian D. Nunn, Ringoes, and Kondareddiar Ramalingam, North Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 13, 1990, Ser. No. 508,433
Int. Cl.[5] A61K *49/02, 43/00*
U.S. Cl. 424—1.1 32 Claims

1. Boronic acid adducts of Metal dioxime complexes having the formula

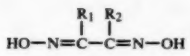
$$MX(Y)_3Z \qquad \text{I}$$

wherein:

M is an isotope of technetium or rhenium,

X is an anion,

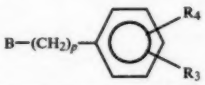
Y is a vicinal dioxime having the formula



II

or a pharmaceutically acceptable salt thereof, and R_1 and R_2 are each independently hydrogen, halogen, alkyl, aryl or a 5 or 6-membered nitrogen, sulfur or oxygen containing heterocycle, or together R_1 and R_2 are $-(CR_8R_9)_n-$ wherein n is 3, 4, 5 or 6 and R_8 and R_9 are each independently hydrogen or alkyl; and

Z is a boron derivative having the formula



wherein P is zero or an integer from one to six, R_3 is NCS, and R_4 is hydrogen, or a water solubilizing functionality selected from the group consisting of COOH, carboxyalkyl, hydroxyalkyl, SO_3H, alkyl-sulfonate, sulphonamide, or hydroxyl, or a pharmaceutically acceptable salt thereof.

5,183,654

NONIONIC X-RAY CONTRAST MEDIUM WITH HIGH IODINE CONTENT

Ulrich Speck, and Peter Blaszkiewicz, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Nov. 2, 1990, Ser. No. 607,115

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1989, 3937118

Int. Cl.[5] A61K *49/04;* **C07C** *233/65*

U.S. Cl. 424—5 **4 Claims**

1. 5-hydroxyacetamido-2,4,6-triido-isophthalic acid-(2,3-dihydroxy-N-methyl-propyl)-(2-hydroxy-ethyl)-diamide.

5,183,655

COMBINED ODOR CONTROLLING ANIMAL LITTER

Anna G. Stanislowski, Walnut Creek; J. Bruce England, Pleasanton, and Steven D. Ratcliff, Antioch, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 705,278, May 24, 1991, Pat. No. 5,135,743, which is a continuation of Ser. No. 370,476, Jun. 23, 1989, Pat. No. 5,018,482, which is a continuation-in-part of Ser. No. 208,953, Jun. 17, 1988, Pat. No. 4,949,672. This application May 26, 1992, Ser. No. 888,957

Int. Cl.[5] A61L *11/00*

U.S. Cl. 424—76.6 **7 Claims**

7. A method of delivering an ammonia-controlling-effective amount of odor controlling agent to an animal waste comprising: applying directly to said waste an aqueous dispersion which comprises a mixture of an ammonia-controlling-effective amount of pine oil and a borate-based compound selected from the group consisting of polyborate, borax and boric acid/borax mixture.

5,183,656

DEODORANT AND PRODUCT IN WHICH THE DEODORANT IS USED

Kazuo Uesaka, Amagasaki; Kazumasa Okita, Ueno, and Tsutomu Arai, Saitama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Okitsumo Incorporated, Mie, both of, Japan

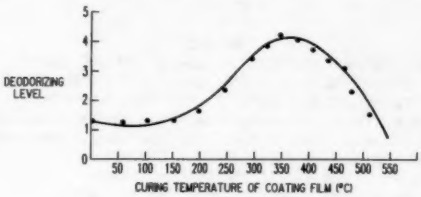
Filed Aug. 2, 1991, Ser. No. 739,433

Claims priority, application Japan, Aug. 3, 1990, 2-207389

Int. Cl.[5] A61L *9/00*

U.S. Cl. 424—76.1 **9 Claims**

1. A deodorant composition, comprising a binder comprising an effective amount of an inorganic silicon compound; and a metal oxide or salt of at least one metal selected from the group consisting of titanium, lanthanum and manganese; or



zirconium phosphate or a combination thereof, which deodorant comprises from 5 to 98 wt % of said binder, from 0.50 to 90 wt % of the metal oxide or salt, from 0 to 94.5 wt % of a colorant or a filler or both, and from 0 to 5 wt % of an additive.

5,183,657

ANTIBODIES FOR USE IN ANTILYMPHOCYTE ANTIBODY THERAPY

Wim Buurman, Maastricht, Netherlands, assignor to Celltech Limited, Berkshire, United Kingdom

PCT No. PCT/GB89/00254, § 371 Date Oct. 22, 1990, § 102(e) Date Oct. 22, 1990, PCT Pub. No. WO89/08460, PCT Pub. Date Sept. 21, 1989

PCT Filed Mar. 13, 1989

Continuation of Ser. No. 585,065, Oct. 22, 1990, abandoned. This application May 7, 1992, Ser. No. 881,317

Claims priority, application United Kingdom, Mar. 11, 1988, 8805792

Int. Cl.[5] A61K *39/395*

U.S. Cl. 424—85.8 **8 Claims**

1. A pharmaceutical composition which comprises an antibody against human α-tumour necrosis and an antilymphocyte antibody in admixture with one or more pharmaceutically acceptable carriers, excipients or diluents.

5,183,658

HANTAAN VIRUS STRAIN ROK84/105 AND VACCINE THEREFOR

Ho W. Lee; Sun J. Riu, both of Seoul, and Chang N. An, Suwon, all of Rep. of Korea, assignors to Korea Green Cross Corporation, Rep. of Korea

Filed Nov. 16, 1989, Ser. No. 438,327

Claims priority, application Rep. of Korea, Nov. 18, 1988, 15199/1988

Int. Cl.[5] A61K *39/12;* **C12N** *7/00*

U.S. Cl. 424—89 **15 Claims**

1. A vaccine for Hantaan virus which is prepared by a process comprising the steps of introducing Hantaan virus strain ROK 84/105 into a rat or mouse, subsequently removing brain tissue from the brain of the rat or mouse, extracting the brain tissue with an extraction fluid, purifiying the resulting virus extract, and inactivating the virus in the resulting virus extract, wherein Hantaan virus strain ROK 84/105 is a strain of Hantaan virus having an international deposit number of ATCC VR 2250.

5,183,659

PROTECTION OF EQUINES AGAINST *STREPTOCOCCUS EQUI*

John F. Timoney, Lansing, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 754,613, Jul. 12, 1985, abandoned. This application Jun. 15, 1988, Ser. No. 207,320

Int. Cl.[5] A61K *39/02;* **C12N** *15/00*

U.S. Cl. 424—92 **10 Claims**

1. A vaccine for protecting equines against *S. equi* which comprises an avirulent strain of *S. equi* known as *S. equi* 709-27

which can be inoculated intranasally or orally in the susceptible equine.

5,183,660

POLYETHYLENE GLYCOL DERIVATIVES, THEIR MODIFIED PEPTIDES, METHODS FOR PRODUCING THEM AND USE OF THE MODIFIED PEPTIDES

Yoshiharu Ikeda, Somerville, Mass.; Yoshiyuki Kai, Kobe, and Keiichi Ono, Sakai, both of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan

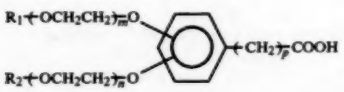
Filed Aug. 15, 1991, Ser. No. 745,496

Claims priority, application Japan, Aug. 28, 1990, 2-227541

Int. Cl.[5] A61K *37/02, 37/48;* **C07C** *63/04, 65/21*

U.S. Cl. 424—94.3 **14 Claims**

13. A method for producing a modified peptide comprising reacting a carboxyl group-activated compound of a polyethylene glycol derivative of the formula



(I)

wherein R_1 and R_2 are the same or different and each represents a lower alkyl, m and n are the same or different and each represents a positive integer and p is 0 or a positive integer, with a peptide having at least one free amino group.

5,183,661

DEER REPELLENT DEVICE AND METHOD

James Messina, Rte. 24, Box 122, Chester, N.J. 07930

Filed Dec. 9, 1991, Ser. No. 804,776

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] A01N *25/24, 65/00, 47/14*

U.S. Cl. 424—405 **4 Claims**

1. A deer repellent assembly comprising:

a 100 foot length of one-quarter inch diameter elongate flexible rope of a cotton and polyester solid braid material for use as a support medium; and

16 fluid ounces of deer repellent liquid formulation consisting of about 15 fluid ounces of water and about 0.125 ounces by weight of deshelled chicken eggs and about 0.063 ounces by weight of pepper and about 0.968 ounces by weight of seventy-five percent thiram dry and an adhesive in a quantity sufficient for adherence to the flexible rope;

said deer repellent liquid formulation being evenly distributed along the entire length of the flexible rope sufficient to wet the rope.

5,183,662

CONTROLLED DRUG RELEASE COMPOSITION

Yasushi Morita, Osaka; Akira Ohtori, Fukuoka, and Masako Andoh, Hyogo, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

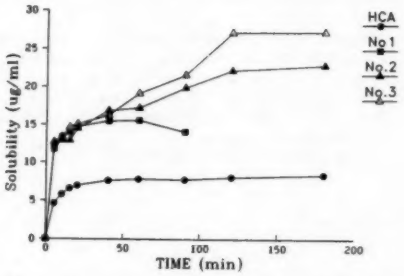
Filed Aug. 27, 1991, Ser. No. 750,482

Claims priority, application Japan, Aug. 30, 1990, 2-229887

Int. Cl.[5] A61K *9/14, 9/70, 31/56*

U.S. Cl. 424—426 **3 Claims**

1. A controlled drug release composition which comprises at least one poorly soluble steroidal drug; at least one water-soluble macromolecular compound selected from the group consisting of polyvinylpyrrolidone, polyethylene glycol and hydroxypropylcellulose in a proportion of 3 to 5 weight parts per weight part of the poorly soluble drug; and at least one biodegradable macromolecular compound selected from the group consisting of polylactic acid, polyglycolic acid and the corresponding copolymers thereof in a proportion of 1 to 3 parts per weight part of the poorly soluble drug.



5,183,663

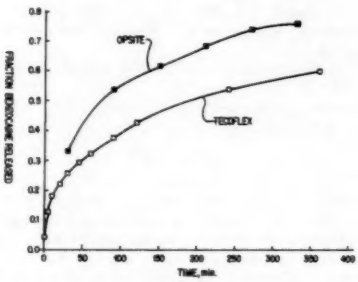
TREATING SKIN LESIONS

Richard W. Greiner, Kennett Square, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 7, 1989, Ser. No. 362,800

Int. Cl.[5] A61F *13/00*

U.S. Cl. 424—443 **1 Claim**



1. A dry bandage comprising a gas- and moisture-permeable, flexible thermoplastic film impregnated with a pharmaceutical that is releasable from the film into a lesion upon application thereto wherein the thermoplastic film is impregnated with the pharmaceutical by contacting the film with the pharmaceutical dissolved in a liquefied gas maintained at supercritical conditions.

5,183,664

THIN FILM ADHESIVE DRESSINGS PREPARATION AND USE

Christopher W. G. Ansell, Sawston, United Kingdom, assignor to Smith and Nephew Associated Companies p.l.c., United Kingdom

Continuation of Ser. No. 339,134, Apr. 17, 1989, abandoned, which is a continuation of Ser. No. 146,778, Dec. 21, 1987, abandoned. This application Dec. 21, 1990, Ser. No. 632,055

Claims priority, application United Kingdom, Sep. 20, 1986, 8622695; Dec. 6, 1986, 8629231; Jan. 16, 1987, 8700943; Jan. 16, 1987, 8700944; Jan. 22, 1987, 871434; PCT Int'l Appl., Sep. 21, 1987, PCT/GB87.00657

Int. Cl.[5] A61L *15/16*

U.S. Cl. 424—445 **30 Claims**

1. A thin film wound dressing which comprises a backing layer having over one surface thereof a continuous adhesive layer, which adhesive comprises a gel adhesive which is not

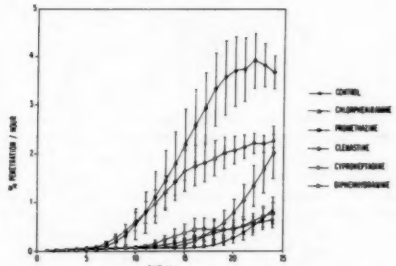
self-adherent and which may be removed from the skin without damage thereto, wherein the dressing has a moisture vapour transmission rate of at least 300 $gm^{-2} hr^{-2}$ at 37° C. and 100 to 10% relative humidity difference when in contact with moisture vapour and wherein the content of water leachable materials from the adhesive is less than 10%.

5,183,665

COMPOSITION FOR PERCUTANEOUS ADMINISTRATION AND METHOD FOR ENHANCING PERCUTANEOUS ABSORPTION OF A PHYSIOLOGICALLY ACTIVE INGREDIENT EMPOLYING THE SAME

Mitsuhiko Hori, San Francisco, Calif., assignor to Nitto Denko Corporation, Osaka, Japan

Filed Jan. 23, 1989, Ser. No. 299,506
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—449 **5 Claims**



1. A method for enhancing percutaneous permeability and absorption of a physiologically active ingredient comprising percutaneously administering:

(a) a pharmaceutically effective amount of a physiologically active ingredient selected from at least one member of the group consisting of a benzodiazepin, a diuretic, a hypertensive, an ethylenediamine, a non-steroid anti-inflammatory agent, sodium salicylate, an anti-cancer agent, a steroid anti-inflammatory agent, an anti-epileptic, an anti-arrhythmic, a psychoneurotropic agent, an antibiotic and a central nervous system stimulant, wherein said pharmaceutically effective amount is about 0.01 to 20% by weight of the total composition, and

(b) a percutaneous absorption enhancing effective amount of an anti-histamine selected from the group consisting of diphehydramine, clematine, cyproheptadine, triperenamine, diphenylpyraline, chlorpheniramine, promethazine, doxylamine, dimenhydrimate, tripelennamine, methapyrilene, pyrilene, thonzylamine, prophenpyridamine and chlorcyclizine, wherein said percutaneous absorption enhancing effective amount is about 0.01 to 20% by weight of the total composition,

wherein component (A) is a different compound from component (B).

5,183,666

PRESSING NOT DELAYED RELEASE OF ACTIVE COMPOUND, PROCESS FOR ITS PRODUCTION AND USE OF POLYHYDROXYBUTYRIC ACID FOR THE PRODUCTION OF SUCH A PRESSING

Brigitta Korsatko-Wabnegg, and Werner Korsatko, both of Graz, Austria, assignors to PCD Polymere Gesellschaft m.b.H., Schwechat-Mannsworth, Austria

Filed Oct. 31, 1990, Ser. No. 606,162
Claims priority, application Austria, Nov. 30, 1989, 2734/89
Int. Cl.[5] A61K *9/14*
U.S. Cl. 424—464 **6 Claims**

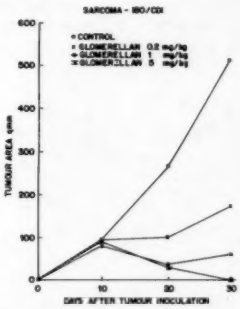
1. Pressing for oral administration having non-delayed release of active compound comprising at least one solid pharmaceutically active compound and as matrix material a homo- and/or copolymer of D(−)-3-hydroxybutyric acid and an amount of at least one solid disintegrant sufficient to cancel the delayed release properties of the homo- and/or copolymer of D(−)-3-hydroxybutyric acid.

5,183,667

THERAPEUTIC IMMUNOSTIMULATION BY GLOMBRELLA CINGULATA

Helmut Koch, Tervuren, and Harald W. W. Röper, Brussel, both of Belgium, assignors to Cerestar Holding B.V., Sas van Gent, Netherlands

Filed Mar. 29, 1991, Ser. No. 677,485
Claims priority, application United Kingdom, Apr. 5, 1990, 9007730
Int. Cl.[5] A61K *9/28, 31/70, 9/48;* **A01N** *25/34*
U.S. Cl. 424—474 **1 Claim**



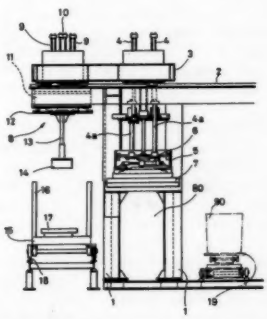
1. A method of treating a tumour disease which comprises administering a therapeutically effective amount of the extracellular beta-glucan Glomerellan produced by Glomerella cingulata CMI CC 330957 or by mutants or variants thereof to immune-stimulate those in need thereof.

5,183,668

PRESSURIZED SLIP CASTING APPARATUS

Kazushige Murata, and Takeshi Ito, both of Aichi, Japan, assignors to Inax Corporation, Tokoname, Japan

Filed Nov. 4, 1991, Ser. No. 786,940
Claims priority, application Japan, Nov. 9, 1990, 2-305338
Int. Cl.[5] B28B *21/00*
U.S. Cl. 425—84 **3 Claims**



1. A pressurized slip casting apparatus comprising:

a horizontal rail;

a replacer made horizontally movable on said horizontal rail;

an upper mold carried vertically movably on said replacer; and

a lower mold for receiving said upper mold in alignment, when said upper mold descends, to cast a slip under pressure inbetween thereby to prepare a green body of a sanitation fixture,

wherein the improvement comprises:

dehydrating means carried vertically movably on said replacer:

a spongy member mounted on a lower end of said dehydrating means for absorbing water from the inside of said lower mold; and

a push plate arranged at a side of said lower mold for abutting and squeezing said spongy member to dehydrate the spongy member.

5,183,669

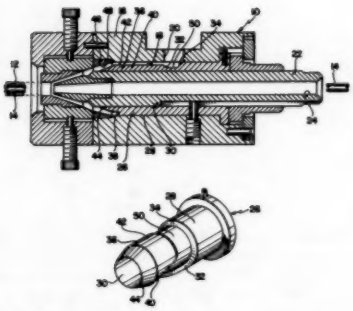
DEFLECTOR FOR CROSSHEAD EXTRUDER

A. Roger Guillemette, 10 Pike St., West Warwick, R.I. 02893

Filed May 28, 1991, Ser. No. 705,947

Int. Cl.[5] B05C *3/10*; B29C *47/28*

U.S. Cl. 425—113 **4 Claims**



1. A deflector for a crosshead;

said crosshead including a body having a main bore extending therethrough, a radial passage extending into a first side of said bore for the introduction of a stream of molten plastic, and a core tube mounted coaxially therein, said core tube having a central bore,

said deflector comprising a cylindrical surface that fits snugly in the main bore adjacent said radial passage, a recessed deflector surface in communication with said radial passage, and a bore for receiving and supporting the core tube coaxially of the main bore,

said cylindrical surface terminating in a generally radial bevelled guide surface which originates adjacent the upstream end of said radial passage and leads to said recessed deflector surface, said guide surface extending around said deflector and curving in a smooth curve away from said radial passage only in a downstream direction so as to merge at a point opposite said first side,

said deflector including an enlargement which extends coaxially around a portion of the deflector adjacent the downstream end thereof and extends around said deflector in opposite directions for about 90° at said first side before curving downstream, said enlargement having a cylindrical outer surface of a diameter greater than that of the recessed deflector surface and less than that of the main bore so as to define an axial passage between said cylindrical outer surface and said main bore whereby molten plastic entering through said radial passage simultaneously flows along said recessed deflector surface and through said axial passage,

said deflector further including a frusto-conical bevel at the downstream end thereof.

5,183,670

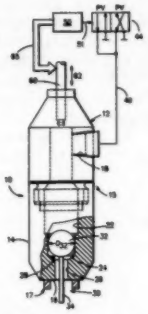
BI-FUNCTIONAL TRANSFER FOOT

Allen E. Trudeau, Ansonia, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1991, Ser. No. 693,749

Int. Cl.[5] B29C *31/00*; B65H *5/00*

U.S. Cl. 425—126.1 **2 Claims**



1. A bi-functional transfer foot for performing pickup and placement operations on a tacky surface of preimpregnated composite materials, said bi-functional transfer foot being activated to perform pickup operations in response to a vacuum force provided by a vacuum source, said bi-functional transfer foot being operative to perform placement operations in response to a pressure force provided by a pressure source, said bi-functional transfer foot being alternately fluidically interconnected to the vacuum source and the pressure source by a switching valve, and wherein activation and operation of said bi-functional transfer foot is provided by control means that provides a control signal for regulating operation of the switching valve, comprising:

valve means structurally configured and operative for utilizing the vacuum force for engaging and retaining the tacky surface of preimpregnated composite materials for pickup operations and for utilizing the pressure source to generate a mechanical force to disengage and release the tacky surface of preimpregnated composite materials for placement operations, said valve means including

a valve housing including a first body member and a second body member sealingly engaged in combination, said second body member having a contact face at one exterior end thereof, said second body member having first, second, and third fluidically interconnected cylindrical chambers coaxially formed therein and an angled shoulder intermediate said second and third cylindrical chambers, said first body member including a pneumatic port fluidically interconnected to the switching valve and a cylindrical pneumatic passage fluidically interconnecting said pneumatic port to said first cylindrical chamber, said first, second, and third cylindrical chambers having first, second, and third diameters, respectively, wherein said first diameter is greater than said second diameter and said second diameter is greater than said third diameter, and wherein said contact face has an opening fluidically interconnected to said third cylindrical chamber and defined by said third diameter thereof,

a sealing member affixed to said contact face to circumscribe said opening thereof, said sealing member having a configuration to minimize adherence between said sealing member and the tacky surface of preimpregnated composite materials during pickup operations, and

a valve member displaceable within said second body member between said second cylindrical chamber and said first cylindrical chamber and vice versa in response to the vacuum force and the pressure force, respec-

tively, said valve member including a spherical head having an integral knock-off stem protruding therefrom, said spherical head having a predetermined configuration such that displacement of said valve member from said first cylindrical chamber to said second cylindrical chamber in response to the pressure force causes said spherical head to set against said angled shoulder wherein a seal is provided between said second cylindrical chamber and said third cylindrical chamber that effectively terminates airflow through said third cylindrical chamber, and wherein said knock-off stem has a predetermined length such that said knock-off stem provides the mechanical force to disengage and release the tacky surface of preimpregnated composite materials from said bi-functional transfer foot during placement operations when said spherical head is caused to seat against said angled shoulder; and wherein

the control means regulates the switching valve to cause bi-functional operation of said valve means in ON and OFF states for pickup and placement operations, respectively, said bi-functional transfer foot being normally biased to said OFF state by the switching valve wherein the pressure source is fluidically interconnected to said pneumatic port so that said movable valve member is positioned in response to the pressure force so that said spherical head thereof is seated against said angled shoulder and said knock-off stem protrudes beyond said sealing member, and wherein the switching valve fluidically interconnects the vacuum source to said pneumatic port to activate said bi-functional transfer foot to said ON state in response to the control signal from the control means when said sealing member and said knock-off stem are proximate the tacky surface of preimpregnated composite materials wherein said valve member is displaced within said second body member from said second cylindrical chamber into said first cylindrical chamber to cause said spherical head to unseat from said angled shoulder so that the vacuum force is fluidically interconnected to said third cylindrical chamber and exerted at said opening to engage and retain the tacky surface of preimpregnated composite materials, and further wherein the tacky surface adheres to the sealing member with the tacky surface of preimpregnated composite materials engaged and retained by the vacuum force exerted by said bi-functional transfer foot.

5,183,671

APPARATUS FOR PROCESSING FISH FOOD

Thomas F. Perez, 21 Legeyt Rd., North Canton, Conn. 06059

Filed Jun. 1, 1990, Ser. No. 531,924

Int. Cl.[5] A23P *1/00*

U.S. Cl. 425—190 **17 Claims**

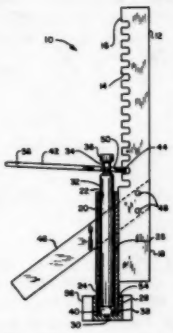
1. A fish food extruder for extruding a viscous wad of fish food into thin filaments, comprising:

a tubular member having an upper end and a lower, closed end defining an extrusion aperture with an effective diameter no greater than about 0.05 inch;

a plunger member situated for telescoping displacement axially within the tubular member, the plunger member having a first, closed end facing the lower end of the tubular member and defining a chamber therebetween for confining a wad of said fish food, and a plunger extension portion including a second end of the plunger member which extends axially beyond the upper end of the tubular member;

a frame member extending longitudinally from the tubular member in parallel with the axis thereof, the frame member containing a plurality of teeth facing said axis; and

manually operable actuating means coupling the plunger extension portion with the frame member, for selectively displacing the plunger member with a mechanical advantage through the tubular member to extrude the wad in the chamber through said aperture, the actuating means including a first handle comprising a lever having a pivot end for engaging one of said teeth, the lever including a free end to be grasped in one hand by the user for manually rotating the lever about said engaged tooth, means intermediate the pivot end and free end for engaging the plunger extension portion and is placing the plunger axially in the tubular member to extrude the wad as the lever is rotated in a first direction of rotation, and means for



permitting the manual transfer of the pivot end of the lever to engage a tooth adjacent to the engaged tooth when the lever is rotated in a second direction of rotation opposite to the first direction of rotation, the actuating means further including a second handle rigidly connected to one of the tubular member and frame member to be grasped by the user's other hand while the user rotates the first handle in the first direction to extrude the wad.

5,183,672

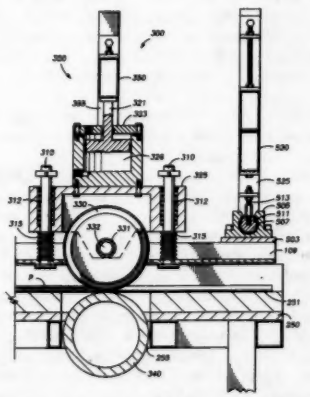
APPARATUS FOR FORMING AT LEAST ONE FOLD LINE PATTERN IN A RIGID PLASTIC MATERIAL

Gary W. Fetterhoff, 1505 E. Reno, Broken Arrow, Okla. 74012, and William R. Blake, Tulsa, Okla., assignors to Gary W. Fetterhoff and James M. Park, both of Tulsa, Okla.

Filed Apr. 16, 1991, Ser. No. 686,036

Int. Cl.[5] B29C *59/04*

U.S. Cl. 425—304 **12 Claims**



1. An apparatus for embossing onto a length of material moving along a linear path at least one fold line pattern comprising a series of generally parallel grooves, the apparatus comprising:

a frame;

a means for moving said material along a linear path;

a means for feeding said material, said feeding means being situated at an upstream end of the conveyor system and located to position the said material on the moving means;

a means for heating said material, said heating means being situated downstream of the feeding means and located to heat the area to be embossed with the fold line pattern to a temperature sufficient to form the fold line pattern; and

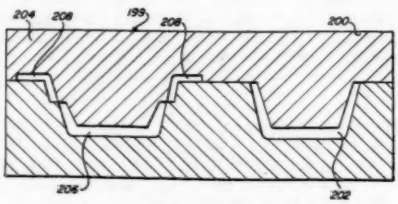
a means for embossing said plastic material, said embossing means comprising a knurled flat roller and a cooperating embossing roller comprising a series of ridges suitable for embossing the fold pattern.

5,183,673

APPARATUS FOR CONTROLLING WEIGHT AND WALL THICKNESS OF A BLOW MOLDED ARTICLE

Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.

Division of Ser. No. 499,018, Mar. 26, 1990, Pat. No. 5,061,417.
This application Jun. 25, 1991, Ser. No. 720,943
Int. Cl.[5] B29C *49/48*
U.S. Cl. 425—522 **14 Claims**



1. A family of blow molds for manufacturing at least two blow molded manufactured articles of different depth, including a first manufactured article having a depth and a second manufactured article having a depth which is substantially less than the depth of the first manufactured article, comprising:

a first mold having mold parts for joining together to define a first mold chamber for receiving a portion of a moldable parison to blow mold the first manufactured article;

a second mold having mold parts for joining together to define

a separate second mold chamber for receiving a portion of the moldable parison to blow mold the second manufactured article, and

at least one waste article forming chamber adjacent to and connecting with at least a portion of said second mold chamber for receiving a portion of the mountable parison and forming at least one separable waste article simultaneously with the blow molding of said second manufactured article, said waste article forming chamber being of a size and shape selected such that a waste article formed in the waste article chamber and the second manufactured article have a total apparent surface area proportional to the total apparent parting line area of the second mold chamber and waste article forming chamber which is a selected percentage of the surface area of the first manufactured article proportional to the parting line area of the first mold chamber, whereby the wall thickness of the first and second manufactured articles are controlled to predetermined thicknesses.

5,183,674

FOOD AND FEEDSTUFF

Thomas Olin, Enbacken 33, S-183 46 Täby, Sweden

PCT No. PCT/SE89/00707, § 371 Date Apr. 25, 1991, § 102(e) Date Apr. 25, 1991, PCT Pub. No. WO90/06064, PCT Pub. Date Jun. 14, 1990
PCT Filed Dec. 1, 1989, Ser. No. 678,972
Claims priority, application Sweden, Dec. 2, 1988, 8804376
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—2 **23 Claims**

1. A process for reducing the excretion of nitrogen from humans or animals while maintaining protein formation, said process comprising administering to said humans or animals food and/or feedstuff wherein protein from said food and feedstuff has been replaced by at least one keto acid of a non-essential amino acid according to the formula R—CO—COOX, wherein R is a part of a non-essential amino acid and X is selected from the group consisting of hydrogen, an alkali metal, an alkaline earth metal or an organic base, wherein said keto acid is present in an amount of 1 to 20% by weight of the protein dry matter present and wherein nitrogen excretion is substantially reduced.

5,183,675

PROCESS FOR PRODUCING SALAD OIL

Koichi Tamura, Yokohama; Nobuo Taguchi, Yokosuka, and Satoshi Tashiro, Yokohama, all of Japan, assignors to The Nisshin Oil Mills, Ltd., Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 727,445
Claims priority, application Japan, Nov. 28, 1990, 2-327113
Int. Cl.[5] A23D *9/02*
U.S. Cl. 426—33 **7 Claims**

1. A process for producing a salad oil which comprises transesterifying a mixture of (A) an oil or fat produced from palm oil and having the following characteristics:

iodine value:	55 to 75
constituent fatty acids:	
palmitic acid:	30 to 42% by weight
oleic acid:	42 to 48% by weight
linoleic acid:	11 to 20% by weight
tripalmitin:	2% by weight or less
open-tube melting point:	5 to 25° C.

and (B) a liquid edible oil other than the component (A) in a weight ratio of 5:95 to 95:5 with immobilized lipase having 1,3-specificity in the absence of solvent and then fractionating the product in the absence of solvent.

5,183,676

PROCESS FOR COUNTERCURRENT EXTRACTION OF COFFEE

Klaus Schlecht, Orbe, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

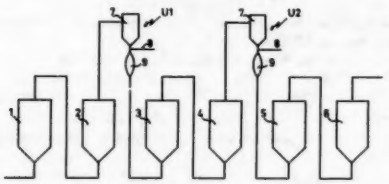
Filed Oct. 3, 1991, Ser. No. 770,584
Claims priority, application European Pat. Off., Oct. 24, 1990, 90120388.5
Int. Cl.[5] A23F *5/26*
U.S. Cl. 426—434 **6 Claims**

1. In a process for extracting roast and ground coffee material in a countercurrent extraction apparatus having a plurality of cells interconnected in series, wherein an extraction liquid is passed downstream from one cell to a next adjacently positioned cell in the series and through the coffee material contained in each cell in countercurrent fashion to obtain an extract from the coffee material, and wherein extract is obtained from at least one cell in the series and is subjected to evaporation at a temperature reduced from a temperature employed for extraction in the extraction cells, the improvements comprising:

obtaining a first extract having a temperature above 150° C.

from an extraction cell, flash evaporating the first extract at a temperature reduced from 150° C. to obtain a first extract product, heating the first extract product to a temperature sufficient for extraction of coffee material contained in a downstream extraction cell and introducing the heated extract product into the downstream cell adjacent the cell in the series from which the first extract was obtained; and

obtaining a second extract from an extraction cell which is positioned in the series at least one cell downstream from



the cell from which the first extract was obtained and which is positioned prior to a last downstream cell in the series, flash evaporating the second extract to obtain a second extract product, heating the second extract product to a temperature sufficient for extraction of coffee material contained in a downstream extraction cell and introducing the heated second extract product into the downstream cell adjacent the cell in the series from which the second extract was obtained; and

wherein the second flash evaporation is carried out at a temperature higher than the first flash evaporation.

5,183,677

BETA-GLUCANE ENRICHED ALIMENTARY FIBER

Ilkka Lehtomäki; Pertti Karinen, both of Rajamaki; Risto Bergelin, Koskenkorva, and Olavi Myllymäki, Espoo, all of Finland, assignors to Oy Alko AB, Helsinki, Finland

Continuation of Ser. No. 461,378, Jan. 5, 1990. This application Sep. 25, 1991, Ser. No. 764,956

Claims priority, application Finland, Jan. 6, 1989, 890079

Int. Cl.[5] A23J *1/12*

U.S. Cl. 426—436 **2 Claims**

1. A beta-glucane enriched grain fiber having a beta-glucane concentration of about 15 to 40% by weight and a starch concentration of 5 to 30% by weight.

5,183,678

METHOD FOR PREPARING PUFF SNACK

Kazumitsu Taga, Neyagawa; Toshihiko Narukami, Ikoma, and Yoshiyuki Miyaoku, Sakai, all of Japan, assignors to House Food Industrial Co., Ltd., Higashi-Osaka, Japan

Filed Oct. 15, 1991, Ser. No. 775,897

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—448 **20 Claims**

1. A method for preparing a puff snack comprising the steps of puffing an ingredient essentially consisting of a bean which may or may not have the husk and having a water content of 9 to 20% in an extruder having a die, wherein the temperature of the die ranges from 90° to 150° C. for said ingredient having a water content of 9 to 11%; the temperature of the die ranges from 100° to 210° C. for said ingredient having a water content of more than 11% and not more than 15%; and the temperature of the die ranges from 160° to 240° C. for said ingredient having a water content of more than 15% and not more than 20%; so that the degree of puffing falls within the range of from 3.0 to 28.0 times the volume of the bean to give a puff product having a water content of not more than 7% by weight or drying the puff product until the water content is not more than 7% by weight and then applying at least one material selected from the group consisting of fat and oil to the resulting puffed product.

5,183,679

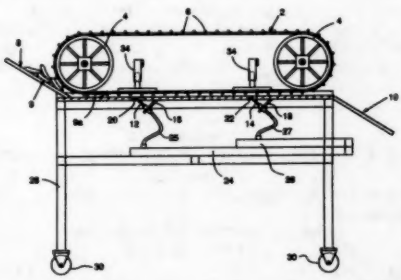
METHOD FOR PROCESSING FROZEN FOOD USING SUPER HIGH PRESSURE WATER JETS

Howard L. Kee, Palermo, Calif., assignor to Kee Equipment & Engineering, Inc., Palermo, Calif.

Filed Jul. 22, 1991, Ser. No. 733,666

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—479 **6 Claims**



1. A method for processing a frozen food item, including the steps of:

conveying the frozen food item past a nozzle array; and

directing one or more super high pressure water jets at a pressure of at least 2000 p.s.i. from the nozzle array with grazing incidence at the frozen food item, to apply a shearing force to the frozen food item as the frozen food item passes the nozzle array.

5,183,680

BAKING AGENT FOR LEAVENED DOUGH

Heinz D. Jodlbauer, Berlin, Fed. Rep. of Germany, assignor to A. Nattermann & Cie. GmbH Corporation of the Federal Republic of Germany, Koln, Fed. Rep. of Germany

Continuation of Ser. No. 547,390, Jul. 3, 1990, abandoned, which is a continuation of Ser. No. 310,036, Feb. 10, 1989, abandoned, which is a continuation of Ser. No. 050,062, May 13, 1987, abandoned. This application Aug. 8, 1991, Ser. No. 742,538

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616597

Int. Cl.[5] A21D *2/32*

U.S. Cl. 426—611 **6 Claims**

1. A baking agent for leavened dough including a phospholipid fraction comprising phosphatidyl choline, phosphatidyl ethanolamine and phosphatidyl inositol, and a fat component, the baking agent comprising:

wherein the phospholipid fraction contains 8% to 17% by weight phosphatidyl choline and 18% to 26% by weight phosphatidyl ethanolamine;

wherein the phospholipid fraction further includes lysophosphatidyl choline, lysophosphatidyl ethanolamine, lysophosphatidyl inositol, phosphatide acid, lysophosphatide acid, phosphatidyl glycerol, lysophosphatidyl glycerol, N-acylphosphatidyl ethanolamine an lyso-N-acylphosphatidyl ethanolamine; and

wherein the phospholipid fraction further includes sterols, sterol glycosides, sugar and/or monoglycerides, diglycerides or triglycerides.

5,183,681

METHOD FOR PREPARING RETORT TOFU

Hidefumi Okamoto, Sakai, and Koji Sengoku, Nara, both of Japan, assignors to House Food Industrial Co., Ltd., Osaka, Japan

Filed Apr. 26, 1991, Ser. No. 691,835
Claims priority, application Japan, May 7, 1990, 2-117053
Int. Cl.[5] A23L *1/20*
U.S. Cl. 426—634 **15 Claims**

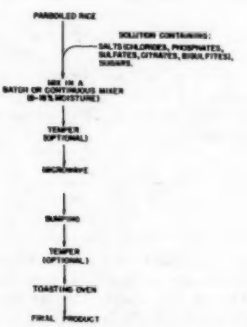
1. A method for preparing retort tofu comprising the steps of adding a coagulating agent to soy milk obtained by removing bean-curd refuse from refuse from a mixture of ground soybean and water, charging the mixture in a heat-resistant container, closely sealing the container and then subjecting the sealed container to a retort treatment, wherein a content of insoluble solids present in the soy milk is controlled to not more than 3% by weight on the basis of the total weight of the soy milk when the content of insoluble solids is determined by centrifuging the soy milk at 1690×g for 3 minutes whereby said controlled amounts of insoluble solids results in a product with increased resiliency.

5,183,682

LOW MOISTURE HOT ROLLING PROCESS AND PRODUCT

Chron-Si Lai, Harrisburg, Pa., assignor to Hershey Foods, Hershey, Pa.

Filed Sep. 29, 1989, Ser. No. 415,095
Int. Cl.[5] A23L *1/18*
U.S. Cl. 426—636 **25 Claims**



1. A low moisture hot rolling process for preparing expanded grain products consisting essentially of:

a. uniformly wetting parboiled grain to a moisture content of between about 8% to 16%;

b. plasticizing the moistened grain at a temperature of from 50° C. to 100° C. whereby no sever loss of moisture occurs during heating;

c. compressing the plasticized grain at a moisture content of 11% to 15% and a temperature of 65° C. to 100° C.; and

d. toasting the compressed grain to obtain an expanded grain product.

5,183,683

PROCESS FOR PRODUCING A FUNCTIONAL PROTEIN PRODUCT FROM VEGETABLE PROTEIN MATERIALS

Stephen D. Mott, Market Harborough, Great Britain, and Richard F. Johnson, Kettering, England, assignors to Protein Technologies International, Inc., St. Louis, Mo.

Filed Jul. 18, 1989, Ser. No. 381,226
Claims priority, application United Kingdom, Jul. 18, 1988, 8817061
Int. Cl.[5] A23L *1/31*
U.S. Cl. 426—641 **8 Claims**

1. A process for producing a granular protein product comprising: blending about one part by weight of a vegetable protein material selected from the group consisting of vegetable protein concentrates and vegetable protein isolates with about 1 to 3 parts by weight of water and about 1 to 6 parts by weight of a frozen animal protein product under conditions of shear to produce a granular protein product.

5,183,684

SINGLE AND MULTILAYER COATINGS CONTAINING ALUMINUM NITRIDE

Leslie E. Carpenter, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 20, 1989, Ser. No. 438,859
Int. Cl.[5] B05D *3/06, 3/02;* **C23C** *16/00*
U.S. Cl. 427—574 **34 Claims**

1. A process for the formation of an aluminum nitride ceramic or ceramic-like coating on a substrate comprising the steps of:

(a) coating said substrate with a liquid containing an alkylaluminum amide having the formula $(R_2AlNH_2)_3$, where R is an alkyl group containing from 1 to 4 carbon atoms;

(b) drying said liquid and thereby depositing a preceramic coating on said substrate; and

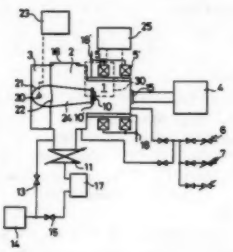
(c) ceramifying said preceramic coating to an aluminum nitride-containing ceramic by heating said preceramic coating to a temperature of between about 400° to about 1000° C. in the presence of ammonia.

5,183,685

DIAMOND FILM DEPOSITION BY ECR CVD USING A CATALYST GAS

Shumpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 509,801, Apr. 17, 1990, abandoned, which is a division of Ser. No. 387,800, Aug. 1, 1989, abandoned, which is a division of Ser. No. 216,333, Jul. 8, 1988, Pat. No. 4,871,581. This application Aug. 19, 1991, Ser. No. 749,618
Claims priority, application Japan, Jul. 13, 1987, 62-175559
Int. Cl.[5] B05D *3/06, 3/14;* **C23C** *16/26*
U.S. Cl. 427—571 **12 Claims**



1. A method of depositing a diamond coating comprising the steps of:

placing an object for deposition in a reaction chamber;

introducing a carbon compound gas into said reaction chamber; and

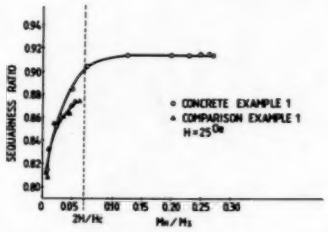
inputting an electromagnetic power to said reaction chamber in order to decompose said carbon compound gas and deposit the diamond on the surface of said object,

wherein a catalytic gas is introduced into said reaction chamber in order to expedite the deposition of said diamond, said catalytic gas being selected from the group consisting of the halide of nickel, the hydride of nickel and the halide of manganese.

5,183,686
METHOD FOR MANUFACTURING MAGNETIC RECORDING MEDIA

Kazunori Komatsu, and Mikio Tomaru, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Feb. 19, 1992, Ser. No. 836,890
Claims priority, application Japan, Feb. 20, 1991, 3-045533
Int. Cl.[5] B05D *3/14*
U.S. Cl. 427—549 11 Claims



1. A method for manufacturing a magnetic recording medium, comprising the steps of:

preparing a magnetic solution by dispersing ferromagnetic particles therein such that the magnetization M_H of said magnetic solution provided by a magnetic field H (Oe) having a predetermined field strength being applied thereto for one minute satisfies the following relation:

$$M_H/M_S > 2H/Hc$$

where M_S is the saturation magnetization of said magnetic solution, Hc is the coercive force (Oe) of the ferromagnetic particles in said magnetic solution, and $Hc/5 \geqq H \geqq Hc/50$;

continuously conveying a support;

applying said magnetic solution to said support being continuously conveyed to form a magnetic layer thereon; and

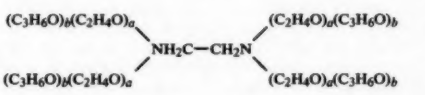
subjecting said magnetic layer thus formed on said support to magnetic orientation treatment and drying.

5,183,687
METHOD OF TREATING POULTRY FOR COCCIDIOSIS

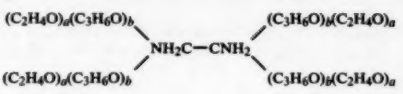
Robert L. Hunter, Tucker, Ga., assignor to Emory University, Atlanta, Ga.

Continuation of Ser. No. 107,358, Oct. 9, 1987, which is a continuation-in-part of Ser. No. 90,795, Aug. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 872,111, Jun. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 787,770, Oct. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 745,917, Jun. 18, 1985, abandoned. This application Nov. 7, 1990, Ser. No. 610,417
Int. Cl.[5] A61K *31/74*
U.S. Cl. 424—78.34 7 Claims

1. A method treating poultry with coccidiosis comprising the step of administering to the poultry with coccidiosis an effective amount of a biologically-active copolymer, the octablock copolymer being selected from the group consisting of an octablock copolymer having the following formula:



and an octablock copolymer having the following formula:



wherein:

the mean aggregate molecular weight of the portion of the octablock copolymer represented by the polyoxypropylene is between approximately 5000 and 7000 daltons;

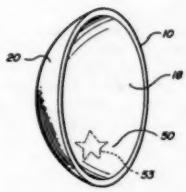
a is a number such that the portion represented by polyoxyethylene constitutes between approximately 10% to 40% of the compound by weight; and

b is a number such that the polyoxypropylene portion of the total molecular weight of the octablock copolymer constitutes between approximately 50% and 90% of the compound by weight.

5,183,688
CONVEX REFLECTIVE SIGN AND METHOD OF MAKING SAME

Paul Sorko-Ram, 1111 N. Centerville Rd., Sturgis, Mich. 49091

Continuation-in-part of Ser. No. 428,637, Oct. 30, 1989, abandoned. This application Jan. 8, 1991, Ser. No. 638,701
Int. Cl.[5] B05D *5/06*
U.S. Cl. 427—164 5 Claims



1. The method of creating a transparent area on an acrylic mirrored surface comprising the steps of:

a. applying a removable mask with a desired pattern of openings therein to one surface of a two-sided transparent acrylic material;

b. applying over said mask a water-based resist mixture comprising polyvinyl alcohol, water, isopropyl alcohol, a surfactant and cornstarch;

c. allowing said resist mixture to dry;

c. allowing said resist mixture to dry;

d. removing said mask, leaving said resist;

e. depositing a thin film of reflective material on said one surface, including said resist; and

f. removing said resist.

5,183,689
PROCESS FOR AN IMPROVED LAMINATED OF ZNSE AND ZNS

Raymond L. Taylor, Saugus; Lee E. Burns, Woburn, and James C. MacDonald, Reading, all of Mass., assignors to CVD, Inc., Woburn, Mass.

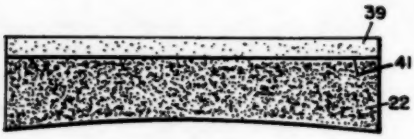
Filed Jul. 15, 1991, Ser. No. 729,980
Int. Cl.[5] C23C *16/00, 16/22*
U.S. Cl. 427—164 2 Claims

1. An improved method for the preparation of an infra-red optical element by chemical vapor deposition of ZnS on a ZnSe substrate at high temperature which eliminates the curvature of the interface caused by the unequal coefficients of thermal expansion for the ZnS and ZnSe, the improvement comprising:

establishing a heating and cooling regimen for the chemical vapor deposition;

determining the curvature of the interface during said regimen;

imparting the negative of that curvature to the surface of the substrate destined to be in contact with the ZnS; and



coating the substrate with ZnS by chemical vapor deposition;

whereby the interface between the ZnSe and ZnS is substantially flat.

5,183,690

STARCH ENCAPSULATION OF BIOLOGICALLY ACTIVE AGENTS BY A CONTINUOUS PROCESS

Merle E. Carr, Chillicothe; William M. Doane, Morton; Robert E. Wing, Peoria, and Edward B. Bagley, Morton, all of Ill., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 25, 1990, Ser. No. 542,566

Int. Cl.[5] **B01J** *13/04;* **A29C** *47/00;* **A61K** *9/62, 9/16*

U.S. Cl. 427—213.31 **7 Claims**

1. A continuous process for imparting predetermined release properties to an encapsulated biologically active agent in a matrix of starchy material comprising the steps:

a. establishing an array of processing parameters in a process for producing said encapsulated biologically active agent by extrusion, which parameters have an effect on the release properties of the active agent from the matrix of starchy material;

b. preselecting a set of conditions defined by the parameters, which set of conditions will yield the predetermined release properties;

c. continuously blending the starchy material, the active agent, and water in an ingredient stream, wherein the starchy material is at a solids concentration of at least 40% and comprises an unmodified regular or waxy cereal, potato, or tapioca starch or a flour containing said starch, or a mixture of these starches or flours;

d. continuously extruding said ingredient stream as an extrudate; and

e. continuously recovering the extrudate;

wherein the conditions of blending, extruding, and recovering comprise said set of conditions whereby the extrudate is an encapsulated biologically active agent having the predetermined release properties.

5,183,691

PAPER COATING HEAD, APPARATUS AND METHOD

Morgan V. Hassell; Frederick J. Stephens, both of St. Austell, and Ernest J. Edwards, Kenilworth, all of England, assignors to ECC International Limited, United Kingdom

Filed Nov. 3, 1989, Ser. No. 431,459

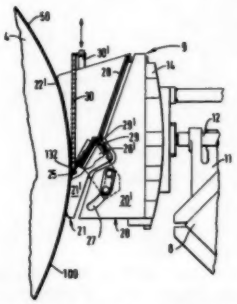
Claims priority, application United Kingdom, Nov. 4, 1988, 8825908

Int. Cl.[5] **B05D** *3/12, 5/00;* **B05C** *3/18, 3/20*

U.S. Cl. 427—286 **12 Claims**

2. A coating apparatus for coating the surface of a sheet material, the apparatus comprising means for moving a sheet material relatively to a coating head and in contact therewith, said coating head comprising a first body portion, securable at a predetermined spacing from the surface to be coated, a coating blade securable to the first body portion and projecting towards said surface to be coated and a second body portion resiliently mounted with respect to the first body portion and, in use, defining with the sheet material with which it is in contact and with the blade, a coating pool from which the coating composition is applied to the sheet material; and reservoir means for feeding said coating composition to said coating pool.

4. A method of coating a sheet material, the method comprising rotating the sheet material in the form of a cylinder about the axis of the cylinder and applying a coating to the sheet material by a coating head having a reservoir loaded with coating composition, the head being moved parallel to the axis



of the cylinder while the latter is rotated, thereby applying the coating composition to a helical strip portion of the cylinder of sheet material, said coating head comprising a first body portion, securable at a predetermined spacing from the surface to be coated, a coating blade securable to the first body portion and projecting towards said surface to be coated and a second body portion resiliently mounted with respect to the first body portion and, in use, defining with the sheet material with which it is in contact and with the blade, a coating pool which is fed by said reservoir and from which the coating composition is applied to the sheet material.

5,183,692

POLYIMIDE COATING HAVING ELECTROLESS METAL PLATE

Prosanto K. Mukerji, Schaumburg; Russell Mallea, Glen Ellyn; George Demet, Arlington Heights, and Harry Fuerhaupter, Villa Park, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1991, Ser. No. 724,029

Int. Cl.[5] **C23C** *26/00*

U.S. Cl. 427—304 **4 Claims**

1. An electroless deposition method for forming a metal-clad polyimide coating comprising

applying to a substrate a liquid film composed of an imidizable polyamic acid compound dissolved in a vaporizable solvent,

heating the liquid film at a temperature and for a time effective to imidize the compound and vaporize the solvent to to form a soft-cured polyimide film comprising between about 5 and 15 weight percent solvent,

contacting an exposed surface of the soft-cured film with an aqueous suspension of palladium-tin colloidal particles to deposit the particles onto the film surface,

treating the deposited particles dissociate the tin and produce palladium nuclei dispersed on the surface,

heating the soft-cured film at a temperature and for a time effective to vaporize the residual solvent to form a hard-cured polyimide layer, whereupon the palladium nuclei are dispersed on the surface of said hard-cured layer, and

treating the nuclei-bearing hard-cured surface with an electroless deposition solution containing a reducible metallic species selected from the group consisting of copper ions and nickel ions, and a reducing agent suitable for reducing said species in the presence of palladium nuclei to a metal

state, whereupon the palladium nuclei catalyze reduction of the species to initiate deposition of metal onto the surface, said treatment continuing for a time sufficient to form a continuous metal plate tightly bonded to the hard-cured polyimide layer.

5,183,693

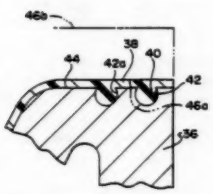
MOLD METHOD AND APPARATUS FOR STABILIZING THE LOCATION OF A SKIN INSERT

Richard D. Rhodes, Jr., Somersworth, and W. David Fredericks, Brookfield, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Division of Ser. No. 420,382, Oct. 12, 1989, Pat. No. 5,006,288. This application Feb. 25, 1991, Ser. No. 660,044

Int. Cl.[5] B29C *33/14, 39/10;* **B32B** *3/30*

U.S. Cl. 428—34.1 **3 Claims**



1. A flexible thermoplastic mold skin insert forming the outer surface of a composite plastic article formed in a foaming mold; said foaming mold having a cavity portion with a raised outer peripheral surface with recessed openings therein and the mold cavity portion further including a depressed skin support surface located beneath the raised outer peripheral surface and wherein the skin insert is supportable on said cavity portion in a stabilized location thereon;

said skin insert having a peripheral edge portion thereon conformable to said raised outer peripheral surface; said skin insert having a first surface engageable with said cavity portion at both said raised outer peripheral surface and said depressed skin support surface and said skin insert further having a second surface adapted to be covered by form material within said foaming mold;

said skin insert having a plurality of integrally foamed retention means formed substantially perpendicular to said first surface at said peripheral edge; said retention means including a root segment joined to said first surface thereof and having a distal end spaced outwardly of said first surface only at said peripheral edge; said integrally formed retention means engageable with said recessed openings for retaining said skin insert within said cavity portion;

said skin insert having an inner portion thereon depressed with respect to said peripheral edge portion; said inner portion conformable to said cavity portion inboard of said raised outer peripheral surface and further including a transition portion joining said inner portion to said peripheral edge to provide for wrinkle free positioning of said inner portion and said transition portion on said mold cavity part and said integrally formed retention means adapted to interlock within said recessed openings to maintain said inner portion and said transition portion wrinkle free during foaming of the composite part.

5,183,694

INHIBITING CORROSION IN REINFORCED CONCRETE

Michael G. Webb, 18 Broadoak Road, Bramhall, Cheshire SK7 3BL, Great Britain

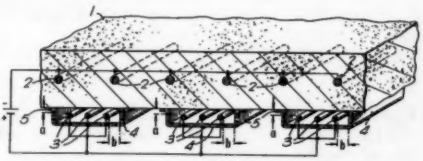
PCT No. PCT/GB89/00404, § 371 Date Oct. 19, 1990, § 102(e) Date Oct. 19, 1990, PCT Pub. No. WO89/10435, PCT Pub. Date Nov. 2, 1989

PCT Filed Apr. 19, 1988, Ser. No. 598,722

Claims priority, application United Kingdom, Apr. 19, 1988, 8809230

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—67 **19 Claims**



1. A reinforced structure of masonry or cementitious material having apparatus for inhibiting corrosion of reinforcement thereof, comprising a pattern of two or more assemblies located on a surface of the structure, each of which comprises:

(a) one or more electrodes overlaying a surface of the structure

(b) ionically conductive cementitious grouting material connecting the electrode(s) to the said surface; and

(c) a moisture-resistant cover having a moisture vapor transmission rate of less than 10^3 g mil per m^2 per 24 hours overlying the electrode(s) and the grouting material, an edge portion of which cover extends at least partly around the electrode(s) and the grouting material towards the said surface of the reinforced structure.

5,183,695

INTERIOR FINISH SURFACE MATERIAL FOR AUTOMOBILES

Shohei Masuhra, Takatsuki; Satoshi Tonoki, Suita; Toshiya Shibukawa, Atsugi, and Hirsohi Sugawara, Zushi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka and Nissan Motor Co., Ld., Yokohama, both of, Japan

Filed Jun. 5, 1992, Ser. No. 894,473

Claims priority, application Japan, Jun. 7, 1991, 3-136493

Int. Cl.[5] B32B *3/26*

U.S. Cl. 428—151 **25 Claims**

1. An interior finish surface material for automobiles comprising a surface layer and at least one of a base layer and a foam layer provided between said surface layer and said base layer, said surface layer being made from a composition comprising (A) 100 parts by weight of a vinyl chloride resin, (B) 20 to 200 parts by weight of at least one of a plasticizer and a thermoplastic elastomer, (C) 2 to 150 parts by weight of an AMBS resin and (D) 0 to 100 parts by weight of an inorganic filler.

5,183,696

COATING OF SUBSTRATES

Martin C. Sanderson, York, England, assignor to CCL Label, Inc., Grand Rapids, Mich.

Filed May 17, 1990, Ser. No. 525,382

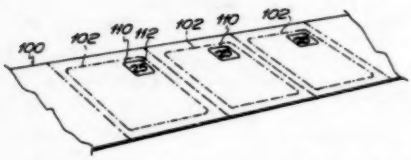
Claims priority, application United Kingdom, May 17, 1989, 8911354

Int. Cl.[5] C09J *7/02*

U.S. Cl. 428—194 **9 Claims**

1. An improved linerless label of the type including a sheet substrate having silicone release coating on one side thereof and a pressure sensitive adhesive on the other side thereof, wherein the improvement comprises a keying coating applied

to the release coating, at least a portion of said keying coating being outermost and exposed, said keying coating comprising a mixture of silicone low tack pressure sensitive adhesive and a solvent.

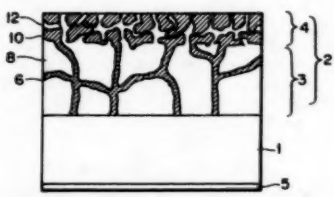


5,183,697

THERMAL IMAGE TRANSFER RECORDING MEDIUM

Youji Ide, Mishima, and Keiichi Shiokawa, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 675,679, Mar. 27, 1991, abandoned. This application May 5, 1992, Ser. No. 879,129
Claims priority, application Japan, Mar. 28, 1990, 2-77098
Int. Cl.[5] B32B *3/00*
U.S. Cl. 428—195 **20 Claims**



1. A thermal image transfer recording medium comprising a support and an ink layer formed thereon which comprises (i) a lower thermal image transfer portion located in the vicinity of the support, comprising a three-dimensional network structure of a resin with a voidage A and a thermofusible ink which is held within said network structure, and (ii) an upper thermal image transfer portion located on top of said lower thermal image transfer portion, comprising a fine porous structure of a resin with a voidage B which is smaller than the voidage A of the network structure, and a thermofusible wax component which is held within said porous structure, and said network structure being at least partially connected to both said porous structure and said support.

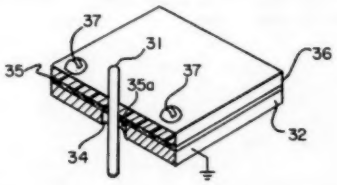
5,183,698

ELECTRICAL OVERSTRESS PULSE PROTECTION

Roger C. Stephenson, Woodland Hills, and Hugh M. Hyatt, Camarillo, both of Calif., assignors to G & H Technology, Inc., Camarillo, Calif.

Filed Mar. 7, 1991, Ser. No. 666,026
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 **26 Claims**

1. A device for protecting against high voltage electrical overstress pulses or transients, comprising a pair of electrodes having faces positioned in spaced contraposed relation to each other, wherein at least one of said electrodes includes a thin lamina of metal and said face thereof is a thin edge of the lamina, and a non-linear electrical resistance composite material, comprising semiconductive particles bound in an insulation matrix, interposed between and making electrical contact with both said contraposed faces, said composite material exhibiting a high resistance to current flow when a low voltage is applied between said electrodes and a low resistance to current flow when a high voltage is applied between said electrodes.



5,183,699

WAFER PROCESSING FILMS

Yasuo Takemura; Osamu Narimatsu, and Kazuyoshi Komatsu, all of Nagoya, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

PCT No. PCT/JP90/00967, § 371 Date Apr. 1, 1991, § 102(e) Date Apr. 1, 1991, PCT Pub. No. WO91/02377, PCT Pub. Date Feb. 21, 1991
PCT Filed Jul. 30, 1990, Ser. No. 667,402
Claims priority, application Japan, Aug. 1, 1989, 1-197965
Int. Cl.[5] B32B *7/02*
U.S. Cl. 428—214 **5 Claims**

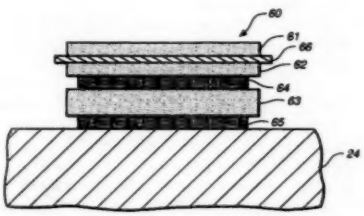
1. A wafer processing film comprising a base film, an adhesive layer provided on one surface of said base film and a polypropylene film arranged on said adhesive, layer,, the surface roughness of the surface of said polypropylene film in contact with said adhesive layer being not greater than 2 μm.

5,183,700

SOLAR CONTROL PROPERTIES IN LOW EMISSIVITY COATINGS

R. Russell Austin, Novato, Calif., assignor to Viratec Thin Films, Inc., Faribault, Minn.

Filed Aug. 10, 1990, Ser. No. 565,941
Int. Cl.[5] B32B *17/06*
U.S. Cl. 428—216 **8 Claims**



1. An interference coating on a transparent substrate, comprising a first film of a transparent material having a high refractive index and an optical thickness less than about one-quarter wavelength at a wavelength between about 450 and 650 nanometers; a transparent conductive second film having a thickness between about 7 and 25 nanometers; a third film of transparent material having a high refractive index and an optical thickness less than about one-quarter wavelength at a wavelength between about 450 to 650 nanometers; a fourth film having a low refractive index and an optical thickness of about one-eighth wavelength at a wavelength between about 800 and 1100 nanometers; a fifth film having a high refractive index and an optical thickness of about one-quarter wavelength at a wavelength between about 800 and 1100 nanometers; the refractive index of said first, third and fifth films between about 1.79 and 2.7 at a wavelength of about 520 nanometers, and the

refractive index of said fourth film between about 1.35 and 1.79 at a wavelength of about 520 nanometers; and wherein said first, second, third, fourth, and fifth films are numbered sequentially beginning with the film farthest from the transparent substrate.

5,183,701

ARTICLES OF HIGHLY ORIENTED POLYOLEFINS OF ULTRAHIGH MOLECULAR WEIGHT, PROCESS FOR THEIR MANUFACTURE, AND THEIR USE

Martinus J. N. Jacobs, Galeen, and Hendrikus J. J. Rutten, Maastricht, both of Netherlands, assignors to Dyneema V.O.F., Sittard, Netherlands

Continuation of Ser. No. 251,453, Sep. 30, 1988, abandoned. This application Aug. 19, 1991, Ser. No. 747,490

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1987, 3733426

Int. Cl.[5] B32B *33/00*; C08J *5/06*; D06M *10/04, 10/06*

U.S. Cl. 428—229 **12 Claims**

1. A polyolefin article having good wetting and adhesive properties for use in combination with matrix materials in the manufacture of composite materials, comprising highly oriented polyolefins having molecular weights greater than 600,000 g/mol, a surface of said article being subjected to a plasma treatment in the presence of reactive gases,

wherein the plasma treatment is carried out under a pressure from 0.2 to 5 mmHg, and at an energy density from 5 to 100 kW/m^3, with a residence time from 5 seconds to 200 seconds

and wherein tensile strength of the plasma treated article is not essentially modified.

5,183,702

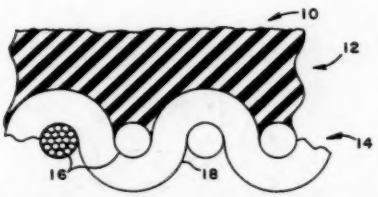
BARRIER FABRICS

Jeffrey L. Taylor, Cincinnati, Ohio; Roy Luckenbach, Charlotte, N.C.; Michael Coco, Bridgeport, and Carl Twickler, Easton, both of Conn., assignors to Dover Corporation, New York, N.Y.

Filed Apr. 3, 1991, Ser. No. 679,735

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—266 **9 Claims**



1. A barrier fabric for use in reusable medical/surgical products, which are to be washed, dried and sterilized subsequent to each use,

said barrier fabric being functionally characterized in that it is impermeable to liquids under a pressure no less than five pounds per square inch, and

this impermeability standard is maintained after the barrier fabric has been subject to at least 75 institutional washing/sterilization cycles,

said barrier fabric comprising

a liquid impervious membrane and

a fabric substrate to which the membrane is attached,

characterized in that

the membrane is formed by a typical, cured methyl vinyl silicone polymer,

the fabric substrate is formed of tightly woven polyester yarns, which form a plurality of curved yarn portions in the form of "nubs" which define one surface of the fabric, and

the silicone membrane is attached to said one surface of the fabric substrate by a bonding mechanism comprised of

portions of the membrane conforming to and in intimate contact with a substantial portion of each of said "nubs", and

a hydrophilic surface characteristic of the portions of said "nubs", with which the membrane is in intimate contact.

5,183,703

BELT STRAP FOR SAFETY BELTS

Johann Berger, Obere Schloss-Strasse 114, D-7077 Aldorf, and Josef Berger, Schwäb. Gmünd-Grossdeinbach, both of Fed. Rep. of Germany, assignors to Johann Berger, Alfdorf, Fed. Rep. of Germany

Filed Jun. 29, 1990, Ser. No. 545,651

Claims priority, application European Pat. Off., Jun. 30, 1989, 89111896.0

Int. Cl.[5] D03D *15/00*

U.S. Cl. 428—292 **4 Claims**

1. A low friction woven belt strap for a safety belt, comprising warp threads made up of individual filaments of at least 15 dtex, said filaments of each thread being substantially parallel at various first regions of the thread but entangled together at various second regions spaced longitudinally of each thread.

5,183,704

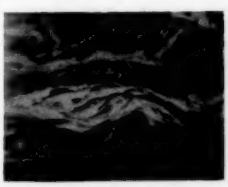
HIGHLY MICROPOROUS 2:1 LAYERED SILICATE MATERIALS

Walter J. Bohrn; Kimberly S. Diffenbaugh; Shelly N. Garman, all of Lancaster, Pa., and Jatin C. Khanpara, St. Joseph, Mich., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Feb. 11, 1991, Ser. No. 653,177

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—305.5 **20 Claims**



1. A process for the preparation of a porous lamellar structured 2:1 layered silicate material comprising flocculating an aqueous dispersion of chemically delaminated lamellae which are selected from the group consisting of mica and vermiculite, with a cationic flocculant which gives the lamellae interlayer cations and, with the lamellae, forms a floc which has an aqueous liquid medium, contacting the floc with a displacement solvent that has at least some miscibility with the aqueous liquid medium whereby the displacement solvent mixes with and extracts the aqueous liquid medium from the floc and drying the floc to leave the lamellae arranged in a lamellar structure, further providing that the lamellae do not collapse so

that after the displacement solvent is removed in drying the lamellar structure is left with a pore volume greater than about 60%.

5,183,705

PRESSURE-SENSITIVE ADHESIVE COMPOSITION HAVING HIGH SHEAR STRENGTH

Ronald B. Birkholz, White Bear Lake, and Mark D. Glad, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 28, 1992, Ser. No. 843,513
Int. Cl.[5] C09U 7/02
U.S. Cl. 428—343 26 Claims

2. A normally tacky pressure-sensitive adhesive composition comprising:

(a) a radial teleblock copolymer of the formula:

$$(A\text{-}B)_n\text{-}Z$$

wherein

A represents a monoalkenyl arene polymer block linked to an elastomeric conjugated diene polymer block,

B represents an elastomeric conjugated diene polymer block,

n represents an integer equal to or greater than 3,

Z represents a multifunctional linking agent;

(b) a tackifying resin; and

(c) an extending oil in an amount of 5 to 20 parts by weight per hundred parts by weight of said copolymer.

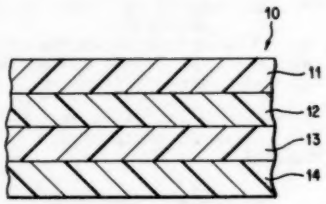
22. An article comprising a substrate having on at least one major surface thereof a layer of the composition of claim 2.

5,183,706

FORMING WEB FOR LINING A RIGID CONTAINER

Solomon Bekele, Taylors, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Aug. 3, 1990, Ser. No. 562,537
Int. Cl.[5] B32B 7/12
U.S. Cl. 428—349 18 Claims



1. A forming web comprising:

a) an outer sealably layer;

b) an interior barrier layer comprising a polymeric material with low oxygen transmission;

c) a polymeric layer which adds bulk to the web, said polymeric material selected from the group, consisting of polystyrene polymer and copolymer; and

d) an innermost adherent layer comprising a polymeric material selected from the group consisting of ethylene acrylic acid copolymer, ethylene methacrylic acid copolymer, tackified ethylene vinyl acetate copolymer, chemically modified ethylene ethyl acrylate copolymer, chemically modified ethylene methyl acrylate copolymer, chemically modified ethylene vinyl acetate copolymer, chemically modified linear low density polyethylene, chemically modified high density polyethylene, chemically modified low density polyethylene, and chemically modified polypropylene; said adherent layer capable of bonding to a paperboard or other container, or to other thermoplastic materials.

5,183,707

INDIVIDUALIZED, POLYCARBOXYLIC ACID CROSSLINKED FIBERS

Carlisle M. Herron, and David J. Cooper, both of Memphis, Tenn., assignors to The Procter & Gamble Cellulose Company, Memphis, Tenn.

Continuation-in-part of Ser. No. 432,648, Nov. 7, 1989, abandoned. This application Oct. 17, 1990, Ser. No. 596,605
Int. Cl.[5] D21H 11/20; D21C 9/00
U.S. Cl. 428—364 13 Claims

1. Individualized, crosslinked wood pulp cellulosic fibers, said fibers comprising cellulosic fibers in substantially individual form having an effective amount of a C_2–C_9 polycarboxylic acid crosslinking agent reacted with said fibers in intrafiber ester crosslink bond form, wherein said crosslinked fibers have a water retention value of from about 28 to about 60, and wherein said C_2–C_9 polycarboxylic acid crosslinking agent is selected from the group consisting of:

(a) aliphatic and alicyclic C_2–C_9 polycarboxylic acids either olefinically saturated or unsaturated and having at least three carboxyl groups per molecule; and

(b) aliphatic and alicyclic C_2–C_9 polycarboxylic acids having two carboxyl groups per molecule and having a carbon-carbon double bond located alpha, beta to one or both of the carboxyl groups,

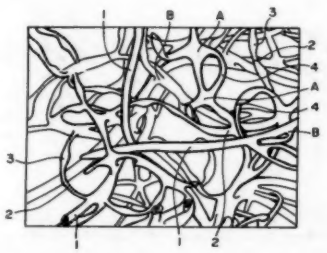
wherein one carboxyl group in said C_2–C_9 polycarboxylic acid crosslinking agent is separated from a second carboxyl group by either two or three carbon atoms.

5,183,708

CUSHION STRUCTURE AND PROCESS FOR PRODUCING THE SAME

Makoto Yoshida, Ibaraki; Hironori Yamada, Matsuyama; Nobuo Takahashi, Ikoma, and Kazushi Fujimoto, Matsumoto, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP91/00703, § 371 Date Jan. 23, 1992, § 102(e) Date Jan. 23, 1992, PCT Pub. No. WO91/19032, PCT Pub. Date Dec. 12, 1991
PCT Filed May 27, 1991, Ser. No. 809,524
Claims priority, application Japan, May 28, 1990, 2-135346
Int. Cl.[5] D02G 3/00
U.S. Cl. 428—373 30 Claims



1. A cushion structure comprising an aggregate of non-elastomeric, crimped polyester staple fiber as the matrix and having a density of 0.005 to 0.10 g/cm^3 and a thickness of at least 5 mm, which is characterized in that the aggregate contains, as dispersed and mixed therein, an elastomeric conjugated fiber composed of a thermoplastic elastomer having a melting point lower than that of the polyester polymer constituting the staple fibers, by at least 40° C. and a non-elastomeric polyester, the former being exposed at least at the fiber surface, in which cushion structure

(A) amebic, all-directionally flexible heat-bonded spots formed by mutual heat fusion of said elastomeric conjugated fibers at their crossing points,

and

(B) semi-all-directionally flexible heat-bonded spots formed by heat fusion of said elastomeric conjugated fibers with

said non-elastomeric polyester staple fibers at their crossing points,

are present scatteringly and in the elastomeric conjugated fiber present between any two adjacent, flexible heat-bonded spots, some of the conjugated fibers have at least one thick portion in the longitudinal direction.

5,183,709

ACICULAR COBALT-MODIFIED IRON OXIDES AND THEIR PREPARATION

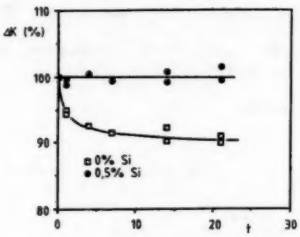
Ekkehard Schwab, Neustadt; Ronald J. Veitch, Ludwigshafen, and Helmut Auweter, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 21, 1990, Ser. No. 507,765

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1989, 3912976

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—404 **2 Claims**



1. An acicular, cobalt-modified iron oxide consisting of a core of an iron oxide of the formula FeO_x where x is from 1.33 to 1.5 and ferrite shell which contains a total amount of from 0.4 to 12% by weight of cobalt ions and not more than 5% by weight of iron(II) ions, the percentages being based on the total amount of the material, wherein this cobalt-modified iron oxide has an alkali metal silicate adsorbed on its surface and an isoelectric point corresponding to pH≦6.5 and the coercive force decreases by less than 5% after storage in air for 21 days at 50° C.

5,183,710

HYDROPHOBIC INORGANIC MATERIALS AND PROCESS FOR MAKING SAME

Anthony J. Gerbino, Homer, N.Y., assignor to U-SUS Distributors, Inc., Scottsdale, Ariz.

Continuation-in-part of Ser. No. 575,239, Aug. 30, 1990, abandoned. This application Apr. 23, 1991, Ser. No. 690,009

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—405 **24 Claims**

16. A hydrophobic inorganic material, comprising an inorganic substrate, a siloxane bonding agent chemically bonded to said substrate at least by Substrate—O—Si bonds, and a hydrophobic silica, said siloxane bonding agent being chemically bonded to said hydrophobic silica at least by Si—O—Si bonds.

5,183,711

AUTOMATIC BONDING TAPE USED IN SEMICONDUCTOR DEVICE

Norio Wada; Katsuya Fukase, and Hirofumi Uchida, all of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

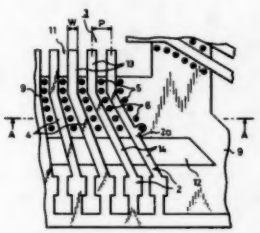
Continuation of Ser. No. 450,067, Dec. 13, 1989, Pat. No. 5,087,530. This application May 28, 1991, Ser. No. 706,155

Claims priority, application Japan, Dec. 13, 1988, 63-314400

The portion of the term of this patent subsequent to Feb. 11, 2009, has been disclaimed.

Int. Cl.[5] H01L *23/495, 23/498*

U.S. Cl. 428—596 **9 Claims**



1. A tape for manufacturing high-frequency semiconductor devices, which tape comprises:

a flexible insulative film;

a plurality of electrically conductive circuit patterns formed on first areas of a first surface of said insulative film for transmitting high-frequency signals, at least one of said conductive circuit patterns being used as a ground connecting line;

a plurality of holes formed in second, other areas of the insulative film, each of said holes having an inner peripheral wall;

a metallic ground layer formed on a second surface of said insulative film opposite to said first surface; and

electrically conductive material formed on the inner peripheral walls of said holes or filled in said holes to prevent crosstalk between said circuit patterns, said ground layer being electrically connected to said respective conductive material and also electrically connected to said ground connecting line.

5,183,712

BATTERY HAVING RESERVE CELL AND THREE OR MORE TERMINALS

Donald T. Beldock, 50 E. 72nd St., Apt. 13A, New York, N.Y. 10021-4246, and Paul P. Craig, Martinez, Calif., assignors to Donald T. Beldock, New York, N.Y.

Continuation-in-part of Ser. No. 649,907, Feb. 4, 1991. This application Jun. 10, 1991, Ser. No. 712,951

Int. Cl.[5] H01M *12/00, 2/10*

U.S. Cl. 429—9 **32 Claims**

1. A sealed battery, comprising:

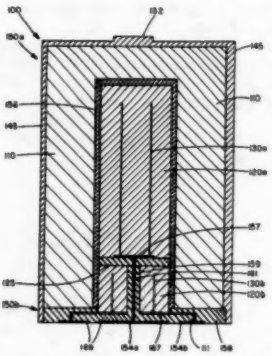
a) cathodic and anodic materials in proximity with each other, with at least one of said cathodic and anodic materials being divided into primary and reserve portions;

b) isolation means adjacently contacting said primary and reserve portions for isolating said primary and reserve portions;

c) a membrane through which ions can flow, said membrane separating said cathodic and anodic materials; and

d) first, second, and third terminals, wherein one of said cathodic and anodic materials is coupled to said first terminal, the primary portion of the other of said cathodic and anodic materials is coupled to said second terminal,

and the secondary portion of the other of said cathodic and anodic materials is coupled to said third terminal, and



wherein said first and second terminals are located on opposed ends of said sealed battery.

5,183,713

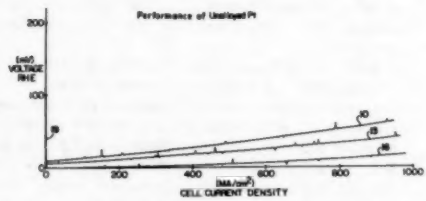
CARBON MONOXIDE TOLERANT PLATINUM-TANTALUM ALLOYED CATALYST

Harold R. Kunz, Vernon, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Jan. 17, 1991, Ser. No. 642,629

Int. Cl.[5] H01M *4/92*

U.S. Cl. 429—44 **10 Claims**



4. A fuel cell, said fuel cell comprised of a cathode with a cathode catalyst, an anode, and a phosphoric acid electrolyte disposed therebetween, a cathode chamber on the nonelectrolyte side of the cathode, an anode chamber on the nonelectrolyte side of the anode, wherein the improvement comprises a binary platinum-tantalum alloyed anode catalyst which comprises about 2 wt % to about 50 wt % platinum to support, and about 2 atom % to about 10 atom % tantalum with said platinum, on an electrically conductive support.

5,183,714

BATTERY CASING

Hidero Mitsui, Kanagawa; Naoki Kamaya, Tokyo; Hiroaki Itoh, and Yuu Sasaki, both of Chiba, all of Japan, assignors to Sony Corporation, Japan

Filed Sep. 19, 1991, Ser. No. 762,405

Claims priority, application Japan, Oct. 9, 1990, 2-272028

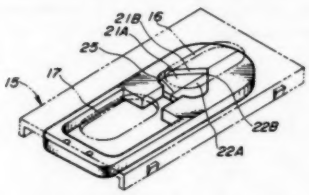
Int. Cl.[5] H01M *10/38*

U.S. Cl. 429—123 **8 Claims**

1. A battery casing for attachment on an electric equipment having positive and negative terminal rods, said battery casing comprising:

positive and negative terminal plates exposed for connection to said respective terminal rods when said battery casing is attached on said electric equipment; and

means for covering at least one of said terminal plates, said covering means operating in response to movement of the corresponding one of said terminal rods during the course of attachment of said battery casing on said electric equipment so as to uncover said one terminal plate to permit said one terminal rod to come into contact with said one terminal plate.



5,183,715

SOLID STATE CELL ELECTROLYTE

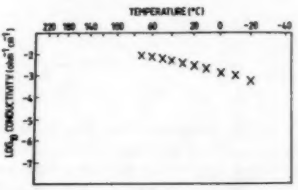
John M. North, Compton, United Kingdom, assignor to Gould Electronics Limited and Dowty Electronic Components Limited, Eastlake, Ohio

Continuation of Ser. No. 642,136, Jan. 15, 1991, Pat. No. 5,085,952, which is a continuation of Ser. No. 421,085, Oct. 13, 1989, abandoned, which is a continuation of Ser. No. 151,152, Feb. 1, 1988, abandoned. This application Nov. 15, 1991, Ser. No. 792,691

Claims priority, application United Kingdom, Feb. 18, 1987, 8703736; Aug. 26, 1987, 8720140

Int. Cl.[5] H01M *6/14*

U.S. Cl. 429—192 **5 Claims**



1. A solid state electrochemical cell comprising a lithium-containing anode, a cathode, and a solid polymer electrolyte comprising a complex of poly(ethylene oxide) associated with a mixture consisting essentially of ethylene carbonate and propylene carbonate and a lithium salt which is capable of conducting lithium ions and wherein the solid polymer electrolyte remains in the amorphous form at a lower temperature than a solid polymer electrolyte containing the same components but without any propylene carbonate.

5,183,716

ALL SOLID-STATE BATTERY

Yoshifumi Nakacho; Akiyoshi Inubushi, and Yuji Tada, all of Tokushima, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP90/00208, § 371 Date Feb. 21, 1990, § 102(e) Date Feb. 21, 1990, PCT Pub. No. WO90/10315, PCT Pub. Date Sep. 7, 1990

PCT Filed Feb. 21, 1990, Ser. No. 598,650

Claims priority, application Japan, Feb. 22, 1989, 1-44327

Int. Cl.[5] H01M *10/40*

U.S. Cl. 429—192 **4 Claims**

1. A solid-state battery comprising a positive electrode, a negative electrode, and a solid electrolyte represented by

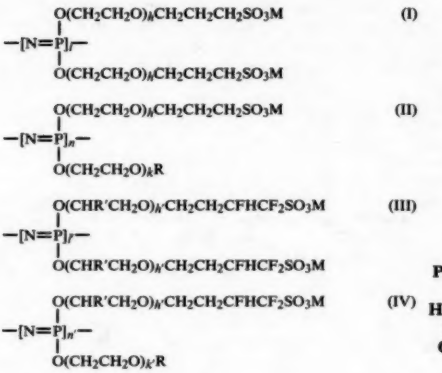
$$[A]_w.([[N=P(Z)_2].(MX)_y]_w)$$

wherein

a) A is a single ionic polymer is at least one of

i) an oligoethylene oxypolyphosphazene compound having a sulfone group or

ii) an oligoalkylene oxypolyphosphazene compound having a fluoroalkylsulfone group, the respective oxypolyphosphazenes having a structure represented by one of formulas (I), (II), (III), and (IV):



R is one or a combination of methyl, ethyl and propyl, R′ is hydrogen or methyl, h and k, or h′ and k′ are each the average number of repeating ethyleneoxy units or alkyleneoxy units and are each a real number in the range of $0 \leqq h \leqq 20$, $0 \leqq k \leqq 20$, $0 \leqq h' \leqq 20$, $0 \leqq k' \leqq 20$, and l, n, l′ and n′ are each an integer of 0 or greater and in the range of $3 \leqq l+n+l'+n' \leqq 200{,}000$;

b) Z is a group represented by $Y-(OCH_2CH_2)_y-O-$ wherein Y is one or a combination of methyl, ethyl and propyl, and y is a real number in the range of $1 \leqq y \leqq 30$;

c) M is an element selected from the main group and subgroup of Groups I and II, transition metals from Groups III to VIII, and lanthanide;

d) X is at least one anion selected from the group consisting of $CF_3SO_3^-$, ClO_4^-, BF_4^-, AsF_6^-, PF_6^-;

e) u is the ratio of [A] to $\{[N=P(Z)_2].(MX)_v\}_w$ and is a real number in the range of $0 < u \leqq 5$;

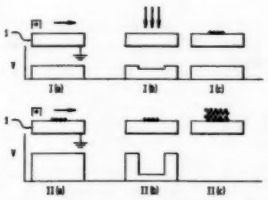
f) v is the ratio of (MX) to $[N=P(Z)_2]$ and is a real number of $0.001 \leqq v \leqq 5$; and

g) w is an integer in the range of $3 \leqq w \leqq 200{,}000$.

5,183,717
FIELD-ENHANCED CHARGE INJECTION AMPLIFICATION

John W. May, Rochester, and Anujit Mukherjee, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1990, Ser. No. 562,347
Int. Cl.[5] G03G 12/22
U.S. Cl. 430—97 **8 Claims**



1. A method of amplifying a weak electrostatic image which electrostatic image is obtained by uniformly charging a photoconductive imaging member to a first potential of a first polarity, and imagewise exposing said imaging member to a low level of radiation, said amplification method comprising:

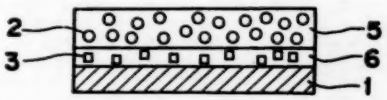
applying a charge injecting toner to said imaging member to create a toner image defined by said electrostatic image,

without fusing or otherwise treating said toner image to reduce the charge on said imaging member, charging said imaging member with a charge of the same polarity as the first polarity, but of sufficiently higher voltage than the original charge placed on the imaging member to create an amplified electrostatic image created by charge injection of the charge into said imaging member through said unfused toner image, said amplified electrostatic image having charge of higher potential in areas of less toner and charge of lower potential in areas of more toner.

5,183,718
PHOTOSENSITIVE MEMBER COMPRISING SPECIFIC DISTYRYL COMPOUND

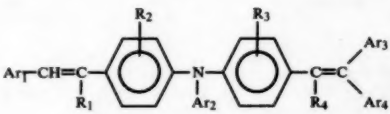
Hideaki Ueda, Kawanishi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 600,720, Oct. 22, 1990, abandoned. This application Jun. 18, 1992, Ser. No. 899,596
Claims priority, application Japan, Oct. 23, 1989, 1-275443; Jun. 27, 1990, 2-170781
Int. Cl.[5] G03G 5/047, 5/09
U.S. Cl. 430—59 **18 Claims**



1. A photosensitive member comprising an electrically conductive substrate; and

a photosensitive layer formed on or over the substrate and comprising a charge generating material and a distyryl compound represented by the general formula [I]



[I]

in which

Ar_1 is a hydrogen atom, an alkyl group, an aralkyl group, an alkenyl group, an alkynyl group, or a heterocyclic group, wherein the aryl group and the heterocyclic group may have a substituent;

Ar_2 is an alkyl group, an aralkyl group or an aryl group, each of which may have a substituent;

Ar_3 and Ar_4 are independently an alkyl group, an aryl group, an aralkyl group or a heterocyclic group, each of which may have a substituent;

R_1 and R_4 are a hydrogen atom, an alkyl group, an aryl group, an aralkyl group;

R_2 and R_3 are a hydrogen atom, an alkyl group, an alkoxy group or a halogen atom.

2. A photosensitive member of claim **1**, wherein the photosensitive layer comprises a charge transporting layer comprising said distyryl compound and a charge generating layer comprising said charge generating material.

5,183,719

ELECTROPHOTOGRAPHIC MATERIAL HAVING AN AMORPHOUS SILICON PHOTOCONDUCTIVE LAYER, AN INTERMEDIATE LAYER AND A SURFACE LAYER

Shigeru Yagi; Yuzuru Fukuda; Taketoshi Higashi, and Masaki Yokoi, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1991, Ser. No. 738,520
Claims priority, application Japan, Aug. 1, 1990, 2-202495
Int. Cl.[5] G03G *5/14*
U.S. Cl. 430—66 **10 Claims**

1. An electrophotographic photoreceptor comprising an electrically conductive substrate having thereon at least a photoconductive layer and a surface layer wherein the photoconductive layer is made mainly of amorphous silicon containing hydrogen and the surface layer is made of a high molecular weight binder with an electrically conductive metal oxide powder dispersed therein, and at least one intermediate layer between the photoconductive layer and the surface layer made mainly of a material containing hydrogen wherein the material is amorphous silicon carbide, amorphous silicon nitride, amorphous silicon oxide or amorphous carbon.

5,183,720

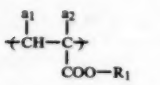
ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 20, 1990, Ser. No. 555,017
Claims priority, application Japan, Jul. 21, 1989, 1-189245
Int. Cl.[5] G03G *9/00*
U.S. Cl. 430—96 **12 Claims**

1. An electrophotographic light-sensitive material comprising a support having provided thereon at least one photoconductive layer containing an inorganic photoconductive substance and a binder resin, wherein the binder resin comprises (A) at least one resin having a weight average molecular weight of from 1×10^3 to 2×10^4 and containing not less than 30% by weight of a copolymerizable component corresponding to a repeating unit represented by the general formula (I) described below and from 0.5 to 20% by weight of a copolymerizable component having at least one acidic group selected from the group consisting of $—PO_3H_2$, $—SO_3H$, —COOH, —OH,

(wherein R represents a hydrocarbon group or —OR′ (wherein R′ represents a hydrocarbon group)) and a cyclic acid anhydride-containing group;



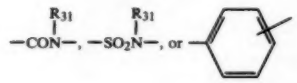
(I)

wherein a_1 and a_2 each represents a hydrogen atom, a halogen atom, a cyano group or a hydrocarbon group; and R_1 represents a hydrocarbon group; and (B) at least one copolymer having a weight average molecular weight of from 5×10^4 to 1×10^6 and comprising at least a monofunctional macromonomer (M) having a weight average molecular weight of not more than 2×10^4 and a monomer represented by the general formula (V) described below, the macromonomer (M) comprising at least one polymerizable component corresponding to a repeating unit represented by the general formulae (IVa) and (IVb) described below, and at least one polymerizable component containing at least one acidic group selected from —COOH, $—PO_3H_2$, $—SO_3H$, —OH,

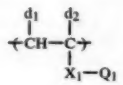
(wherein R_0 represents a hydrocarbon group or $—OR_0'$ (wherein R_0' represents a hydrocarbon group)), —CHO, and an acid anhydride-containing group, and the macromonomer (M) having a polymerizable double bond group represented by the general formula (III) described below bonded to only one terminal of the main chain of the polymer;

(III)

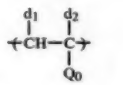
wherein X_0 represents —COO—, —OCO—, $—CH_2OCO—$, $—CH_2COO—$, —O—, $—SO_2—$, —CO—, —CONHCOO—, —CONHCONH—,



(wherein R_{31} represents a hydrogen atom or a hydrocarbon group), and c_1 and c_2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—Z_1 or —COO—Z_1 bonded via a hydrocarbon group (wherein Z_1 represents a hydrogen atom or a hydrocarbon group which may be substituted);



(IVa)



(IVb)

wherein X_1 has the same meaning as X_0 in the general formula (III); Q_1 represents an aliphatic group having from 1 to 18 carbon atoms or an aromatic group having from 6 to 12 carbon atoms; d_1 and d_2, which may be the same or different, have the same meaning as c_1 and c_2 in the general formula (III); and Q_0 represents —CN, $—CONH_2$, or

(wherein Y represents a hydrogen atom, a halogen atom, an alkoxy group or $—COOZ_2$ (wherein Z_2 represents an alkyl group, an aralkyl group, or an aryl group));

(V)

wherein X_2 has the same meaning as X_1 in the general formula (IVa); Q_2 has the same meaning as Q_1 in the general formula

(IVa); and e_1 and e_2, which may be the same or different, have the same meaning as c_1 and c_2 in the general formula (III).

5,183,721

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 20, 1990, Ser. No. 495,953

Claims priority, application Japan, Mar. 20, 1989, 1-69011; Apr. 14, 1989, 1-93144

Int. Cl.[5] G03G *5/00*

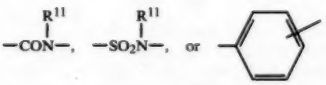
U.S. Cl. 430—96 **8 Claims**

1. An electrophotographic light-sensitive material comprising a support having provided thereon a photoconductive layer containing at least inorganic photoconductive particles and a binder resin, wherein the binder resin comprises a graft-type copolymer formed from at least a monofunctional macromonomer (M) having a weight average molecular weight of not more than 2×10^4 and a monomer represented by the following formula (III), said macromonomer (M) comprising at least one polymer component represented by the following formulae (IIa) and (IIb) and at least one polymer component containing at least one polar group selected from —COOH, $-PO_3H_2$, $-SO_3H$, —OH, and

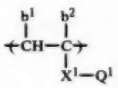
(wherein R^1 represents a hydrocarbon group or $-OR^2$ (wherein R^2 represents a hydrocarbon group)), and said macromonomer (M) having a polymerizable double bond group represented by the following formula (I) bonded to only one terminal of the main chain of the polymer;

(I)

wherein X^o represents —COO—, —OCO—, $-CH_2OCO-$, $-CH_2COO-$, —O—, $-SO_2-$, —CO—,



(wherein R^{11} represents a hydrogen atom or a hydrocarbon group), and a^1 and a^2, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, —COO—Z^1 or —COO—Z^1 bonded via a hydrocarbon group (wherein Z^1 represents a hydrogen atom or a hydrocarbon group which may be substituted);

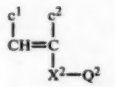


(IIa)

(IIb)

wherein X^1 has the same meaning as X^o in formula (I); Q^1 represents an aliphatic group having from 1 to 18 carbon atoms or an aromatic group having from 6 to 12 carbon atoms; b^1 and b^2, which may be the same or different have the same meaning as a^1 and a^2 in formula (I); and V represents —CN, $-CONH_2$, or

wherein Y represents a hydrogen atom, a halogen atom, an alkoxy group or $-COOZ^2$ (wherein Z^2 represents an alkyl group, an aralkyl group, or an aryl group));



(III)

wherein X^2 has the same meaning as X^o in formula (I); Q^2 has the same meaning as Q^1 in formula (IIa); and c^1 and c_2, which may be the same of different, have the same meaning as a^1 and a^2 in formula (I).

5,183,722

POSITIVE PHOTOSENSITIVE COMPOSITION FOR FORMING LENSES CONTAINING 1,2-NAPHTHOQUINONE DIAZIDE SULFONATE PHOTOSENSITIZER, ALKALI-SOLUBLE RESIN AND THERMOSETTING AGENT AND PROCESS FOR PRODUCING THE COMPOSITION

Yoshitaka Tsutsumi, Kudamatsu; Teruhisa Uemura, and Masazumi Hasegawa, both of Shinnanyo, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Nov. 30, 1990, Ser. No. 620,002

Claims priority, application Japan, Dec. 1, 1989, 1-310512

Int. Cl.[5] G03F *7/023*; G03C *1/61*

U.S. Cl. 430—169 **8 Claims**

1. A positive photosensitive composition for forming lenses, which comprises in admixture a polymer in an amount effective to maintain transparency when said lenses are heated again after being molded, a photosensitive agent in a photosensitizing effective amount, a thermosetting agent in an amount effective to impart heat resistance and solvent resistance to said lenses, and an amount of a solvent sufficient to at least dissolve the polymer, photosensitive agent and thermosetting agent, wherein said polymer is an alkali-soluble resin having an aromatic ring component and a carboxylic acid component partially modified by esterification or amidification, a vinyl phenol polymer or a hydrogenated vinyl phenol polymer having hydroxyl groups modified by alkylation, acylation or sulfonylation, or a novolak polymer or a hydrogenated novolak polymer having hydroxyl groups modified by alkylation, acylation or sulfonylation, said photosensitive agent is a 1,2-naphthoquinone diazide sulfonate and said thermosetting agent is a thermosetting agent capable of imparting heat resistance and solvent resistance at the time of forming lenses by heat treatment.

5,183,723

COLORED IMAGE ON A DEGRADABLE SHEET MATERIAL AND METHOD OF FORMATION

Stephan J. W. Platzer, Califon; Arthur E. Procter, Long Valley, both of N.J., and Thomas Dunder, Chapel Hill, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 260,785, Oct. 21, 1988, Pat. No. 5,100,757. This application Dec. 13, 1991, Ser. No. 807,290

Int. Cl.[5] **C03F** *7/021, 7/023, 7/032;* **G03C** *5/18*

U.S. Cl. 430—160 **22 Claims**

1. A photosensitive article which comprises a colored image on a degradable sheet material, said article prepared by

a. providing a receiver sheet composite formed by adhering two self-supporting, transparent, heat, pressure and developer resistant polymeric films having transparent, pressure or heat sensitive adhesive layers on only one side of the polymeric films to opposite sides of a degradable sheet material via the adhesive layers; and

b. providing a photosensitive element which comprises in order:

i) a substrate having a release surface; and

ii) a photosensitive layer on said release surface, which photosensitive layer comprises a light sensitive component selected from the group consisting of negative working, polymeric diazonium compounds or positive working quinone diazide compounds or photopolymerizable compositions in an amount sufficient to photosensitive the layer; and a resinous binder composition in an amount sufficient to bind the layer components into a uniform film; and at least one colorant in an amount sufficient to uniformly color the layer; and

iii) an optional, nonphotosensitive, colorless adhesive layer directly adhered to said colored photosensitive layer, which adhesive layer has a softening point in the range of from about 60° C. to about 180° C.; and

c. either

i) laminating said photosensitive element with heat and pressure via said photosensitive or adhesive layer of the photosensitive element to one side of said receiver sheet composite; and removing said substrate by the application of peeling forces; and imagewise exposing said photosensitive layer to actinic radiation to thereby produce image areas in either the exposed or unexposed areas and oppositely non-image areas in either the unexposed or exposed areas; or

ii) imagewise exposing said photosensitive layer to actinic radiation to thereby produce image areas in either the exposed or unexposed areas and oppositely non-image areas in either the unexposed or exposed areas; and laminating said photosensitive element with heat and pressure via said photosensitive or adhesive layer of the photosensitive element to one side of said receiver sheet composite; and removing said substrate by the application of peeling forces; or

iii) laminating said photosensitive element with heat and pressure via said photosensitive or adhesive layer of the photosensitive element to one side of said receiver sheet composite; and imagewise exposing said photosensitive layer to actinic radiation to thereby produce image areas in either the exposed or unexposed areas and oppositely nonimage areas in either the unexposed or exposed areas; and removing said substrate by the application of peeling forces; and thereafter

d. removing the nonimage areas of said photosensitive layer produced in step (c) with a liquid developer, which removing is conducted at a temperature at which said photosensitive element is substantially nontacky; wherein the image areas are in the exposed areas and the non-image areas are in the unexposed areas when the light sensitive component is a negative working, polymeric diazonium compound or a photopolymerizable composition, and the image areas are in the unexposed areas and the non-image areas are in the exposed areas when the light sensitive component is a positive working quinone diazide compound; and thereafter

e. optionally repeating steps (b) through (d) at least once whereby another photosensitive element produced according to step (b) having at least one different colorant is laminated onto the nonremoved image portions of the previously processed photosensitive layer or layers on the receiver sheet composite; and

f. optionally repeating steps (b) through (e) with other photosensitive elements produced according to step (b) which are laminated, exposed, and developed on the other side of the receiver sheet composite.

5,183,724

METHOD OF PRODUCING A STRIP OF LEAD FRAMES FOR INTEGRATED CIRCUIT DIES IN A CONTINUOUS SYSTEM

Frank J. Johnson, Santa Cruz, Calif., assignor to Amkor Electronics, Inc., West Chester, Pa.

Filed Dec. 18, 1990, Ser. No. 629,440

Int. Cl.[5] **G03C** *5/00;* **H01L** *21/60*

U.S. Cl. 430—312 **12 Claims**

11. A continuous method for producing a strip of lead frames for integrated circuit dies, comprising

feeding continuously a strip of platable material for making a strip of lead frames so that the strip serves as a substrate having upper and lower faces,

cleaning and preparing the substrate for plating with copper,

plating both faces of the substrate with copper in a continuous manner to a thickness of 5 to 10 microinches,

selectively silver plating the upper faces of the substrate to a thickness of 100 to 150 microinches,

simultaneously laminating both faces of the substrate with a photosensitive film,

exposing selected portions of the film to high intensity light and developing the exposed film which is retained on the strip as a resist film and washing away the unexposed, undeveloped film to reveal the outlines of a mini strip of six lead frames,

removing any exposed silver from the substrate,

removing the exposed area of the substrate by etching the substrate in FeC_{13},

stripping any silver edges overhanging,

removing the resist film,

removing any exposed copper plating from the substrate and retaining any copper covered by the silver plating,

rinsing the substrate clean and air drying it, and

taping, downsetting, cutting and packing the substrate into mini strips of six lead frames.

5,183,725

ELECTRODE PATTERN FORMING METHOD

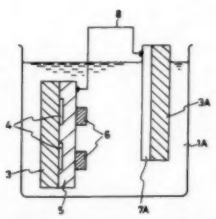
Hiromi Nishino; Keiji Tarui, both of Kitakatsuragi; Hideyuki Toyoshi, Tenri, and Tatsuo Morita, Souraku, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 1, 1990, Ser. No. 592,443

Claims priority, application Japan, Oct. 3, 1989, 1-259857; Nov. 22, 1989, 1-303772

Int. Cl.[5] **G03F** *7/00*

U.S. Cl. 430—313 **22 Claims**



1. An electrode pattern forming method comprising the steps of:

forming a primary transparent conductive film and an auxiliary transparent conductive film on first and second substrates, respectively;
covering said primary transparent conductive film with an aluminum film;
forming a photoresist on said aluminum film;
exposing said photoresist;
developing said photoresist by electrically connecting said primary film and said auxiliary film and immersing said first substrate and a portion of said second substrate in an electrolyte to prevent corrosion of said primary film and to form a photoresist pattern; and
etching said aluminum film using said photoresist pattern as a mask.

5,183,726
LIGHT-SENSITIVE RECORDING MEDIUM AND PROCESS FOR PRODUCING SAME

Hitoshi Taniguchi, and Fumio Matsui, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Feb. 12, 1991, Ser. No. 654,445
Claims priority, application Japan, Sep. 4, 1990, 2-233930
Int. Cl.[5] G11B *7/24*
U.S. Cl. 430—342 **5 Claims**

1. A light-sensitive recording medium comprising a substrate and a recording layer formed thereon, wherein said recording layer contains a photochromic material capable of cis-trans isomerization upon irradiation with light, and not more than 50 mol % of the photochromic material has a trans configuration when the recording layer is in a color-disappearing state which is formed by irradiating the recording layer with light having a wavelength of 360 to 460 nm to cause coloration of the recording layer and then irradiating the recording layer with light having a wavelength of 500 to 600 nm to cause color disappearance in the recording layer.

5,183,727
COLOR PHOTOGRAPHIC RECORDING MATERIAL PROCESSING

Eric R. Schmittou, and Allan F. Sowinski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 19, 1991, Ser. No. 747,895
Int. Cl.[5] G03C *5/38*
U.S. Cl. 430—372 **7 Claims**

1. An image forming process for a color negative recording material comprising a support and at least one silver halide emulsion imaging unit sensitive to a region of the electromagnetic spectrum, said unit containing a dye-forming coupler, and at least one high tabularity silver halide emulsion sensitive to light, wherein:

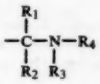
a) said unit contains from about 0.2 to 3.0 g/m^2, based on silver, of a silver halide emulsion in which greater than 50% of the projected surface area is provided by tubular grains having a tabularity between 50 and 25,000;
b) said unit has an iodide content between 0 and 40 mole percent;
c) said color recording material has a silver halide content of less than about 7.0 g/m^2, based on silver;
d) said color recording material has an iodide content of less than about 0.35 g/m^2;
e) said color recording material has a positive contrast of 0.9 or less when the recording material is exposed and processed;

said process comprising subjecting said color negative recording material to color development and subsequently fixing the developed material in a fixer bath which has a thiosulfate concentration from about 0.05 to about 3.0 molar and has an ammonium concentration of 0.0 to about 1.2 molar.

5,183,728
PHOTOGRAPHIC SILVER HALIDE MATERIALS AND PROCESS COMPRISING NEW PYRAZOLOAZOLE COUPLERS

Robert F. Romanet, and Teh-Hsuan Chen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 297,459, Jan. 13, 1989, abandoned, which is a continuation of Ser. No. 23,518, Mar. 9, 1987, abandoned. This application Sep. 12, 1990, Ser. No. 580,978
Int. Cl.[5] G03C *7/32*
U.S. Cl. 430—386 **17 Claims**

1. A photographic element comprising a support, at least one photographic silver halide emulsion and a photographic pyrazoloazole coupler having substituted on the azole ring of the coupler a group represented by the structure:



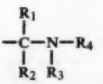
wherein:

R_1 and R_2 are individually hydrogen, unsubstituted or substituted alkyl or unsubstituted or substituted aryl;
R3 and R4 are individually hydrogen, unsubstituted or substituted alkyl, unsubstituted or substituted aryl, or

wherein at least one of R_3 and R_4 is alkyl, aryl or

R_5 is unsubstituted or substituted alkyl, unsubstituted or substituted aryl, or NH—R_6; and
R_6 is unsubstituted or substituted alkyl or unsubstituted or substituted aryl and wherein the photographic silver halide emulsion is a silver bromoiodide emulsion.

9. A process of forming a photographic image which comprises developing an exposed silver halide emulsion layer with a color developing agent in the presence of a photographic pyrazoloazole coupler wherein the pyrazoloazole coupler has substituted on the azole ring of the coupler a group represented by the formula:



wherein:

R_1 and R_2 are individually hydrogen, unsubstituted or substituted alkyl, or unsubstituted or substituted aryl;
R_3 and R_4 are individually hydrogen, unsubstituted or substituted alkyl, unsubstituted or substituted aryl, or

wherein at least one of R_3 and R_4 is alkyl or aryl or

R_5 is unsubstituted or substituted alkyl, or NH—R_6; and

R_6 is unsubstituted or substituted alkyl, or unsubstituted or substituted aryl and further wherein said silver halide emulsion layer is a silver bromoiodide emulsion layer.

5,183,729

METHOD FOR FORMING COLOR IMAGE

Hideki Naito; Shigeki Yokoyama, and Jiro Tsukahara, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1991, Ser. No. 677,252

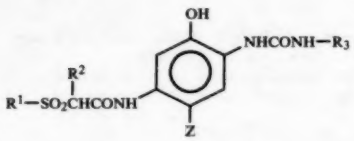
Claims priority, application Japan, Mar. 12, 1990, 2-153629; Mar. 30, 1990, 2-85620; Jan. 31, 1991, 3-31637

Int. Cl.[5] G03C *7/30, 7/34*

U.S. Cl. 430—385 **21 Claims**

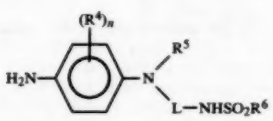
1. A method for forming a color image, which comprises imagewise exposing to light and then developing a silver halide color photographic material having at least one layer containing a cyan coupler represented by the following formula (I):

Formula (I)



wherein R^1 represents an alkenyl group, or a cycloalkyl group, R^2 represents an alkyl group having a total C-number of 4 to 30, an alkenyl group having a total C-number of 4 to 30, or a cycloalkyl group having a total C-number of 4 to 30, R^3 represents an aryl group, and Z represents a hydrogen atom or a group capable of being released upon a coupling reaction, with a color developer containing a color-developing agent represented by the following formula (D):

Formula (D)



wherein R^4 represents a hydrogen atom, a halogen atom, or a methyl group, R^5 and R^6 each represent a methyl group or an ethyl group, L represents a methylene group or an ethylene group, and n is 1 or 2.

5,183,730

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL IMPROVED IN GRADATION, PROCESSING STABILITY AND OTHER PROPERTIES

Toshihiko Yagi, Shiroyama, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Oct. 2, 1990, Ser. No. 591,975

Claims priority, application Japan, Oct. 4, 1989, 1-259529

Int. Cl.[5] G03C *1/46*

U.S. Cl. 430—503 **24 Claims**

1. A silver halide photographic light-sensitive material having a support and provided thereon a blue-sensitive emulsion layer, a green-sensitive emulsion layer and a red-sensitive emulsion layer, wherein at least one of said color-sensitive emulsion layers comprises (a) tabular silver halide grains having an average aspect ratio of grain diameter to grain thickness of not less than 1.2; and (b) core/shell type regular crystal silver halide grains of which the average projection area accounts for not more than 40% of that of said tabular silver halide grains.

5,183,731

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING EPOXY COMPOUND

Osamu Takahashi, and Nobuo Furutachi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 234,113, Aug. 19, 1988, abandoned. This application Jan. 25, 1991, Ser. No. 646,442

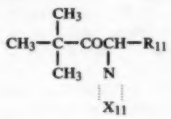
Claims priority, application Japan, Aug. 20, 1987, 62-207254

Int. Cl.[5] G03C *1/38, 7/32*

U.S. Cl. 430—551 **9 Claims**

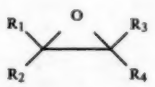
1. A silver halide color photographic light-sensitive material comprised of a support having thereon at least one light-sensitive emulsion layer containing at least one yellow coupler represented by the general formula (I) and a sparingly water soluble epoxy compound represented by the general formula (II) and having a solubility in water at 18° C. of not more than 1% by weight, said epoxy compound being present in an amount of 20 to 200 weight % based on the amount of coupler represented by formula (I):

(I)



where R_{11} represents a substituted N-phenylcarbamoyl group having 7 to 42 carbon atoms wherein the substituent is selected from a member consisting of an aliphatic group, an aliphatic oxy group, an aromatic oxy group, an ester group, an amido group, a carbamoyl group, a sulfamoyl group, an imido group and a halogen atom and X_{11} represents a non-metallic atomic group required for forming a 5- or 6-membered ring; and the coupler may form a dimer or a higher polymer;

(II)



R_1, R_2, R_3 and R_4, which may be the same or different, each represents a hydrogen atom, an aliphatic group, an aryl group, an aliphatic oxycarbonyl group, an aromatic oxycarbonyl group or a carbamoyl group, provided at least one of R_1, R_2, R_3 and R_4 represents a group other than hydrogen atoms; the total number of the carbon atoms contained in R_1, R_2, R_3 and R_4 is from 8 to 60; R_1 and R_2, R_3 and R_4, or R_1 and R_3 may be linked to form a 5 - to 7-membered ring; at least one of R_1, R_2, R_3 and R_4 may have at least one epoxy group; and the epoxy compound may form a dimer or a higher polymer.

5,183,732

PROCESS FOR THE PREPARATION OF HIGH CHLORIDE TABULAR GRAIN EMULSIONS (V)

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 763,382, Sep. 20, 1991, abandoned. This application Jan. 13, 1992, Ser. No. 820,168

Int. Cl.[5] G03C *1/035, 1/07*

U.S. Cl. 430—569 **17 Claims**

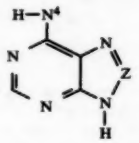
1. A process of preparing a radiation sensitive high aspect ratio tabular grain emulsion, wherein tabular grains of less than 0.3 μm in thickness and an average aspect ratio of greater than 8:1 account for greater than 50 percent of the total grain projected area, said tabular grains containing at least 50 mole percent chloride, based on silver, comprising

introducing silver ion into a gelatino-peptizer dispersing medium containing

a stoichiometric excess of chloride ions with respect to the

silver ions further characterized by a chloride ion concentration of less than 0.5 molar,

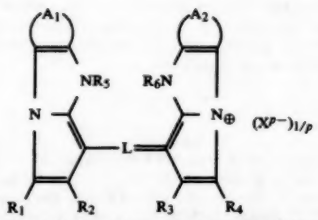
a pH of from 4.6 to 9.0, and
a grain growth modifier of the formula:



where
N^4 is an amino moiety and
Z represents the atoms completing a 5 or 6 member ring.

5,183,733
SILVER HALIDE PHOTOGRAPHIC MATERIALS
Yoshio Inagaki, and Tadashi Ikeda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 28, 1991, Ser. No. 723,154
Claims priority, application Japan, Jun. 29, 1990, 2-172183
Int. Cl.[5] G03C *1/14*
U.S. Cl. 430—583 **8 Claims**

1. A silver halide photographic material, comprising a support having thereon a layer which contains a compound represented by the following general formula (I):



(I)

wherein A_1 and A_2 each represents groups of atoms which are required to complete aromatic rings, which may be substituted or unsubstituted; R_1, R_2, R_3 and R_4 each independently represents a hydrogen atom, an alkyl group, an alkenyl group, a phenyl group, a five- or six-membered heterocyclic group, an acyl group or an alkoxy group, which may be substituted or unsubstituted; R_5 and R_6 each independently represents an alkyl group, a phenyl group, a naphthyl group or a five- or six-membered heterocyclic group, which may be substituted or unsubstituted; X represents a p-valent anion; p represents 1, 2 or 3; L represents a methine group which may be substituted or unsubstituted, or a trivalent linking group wherein three, five or seven methine groups are linked by conjugated double bonds; and X may be bonded to A_1, A_2, R_1 to R_6 or L to form an intramolecular salt.

5,183,734
ANTIBODIES, DIAGNOSTIC SYSTEMS AND METHODS FOR ASSAYING SV40 HBXAG
Ann M. Moriarty, San Diego, Calif., assignor to The Scripps Research Institute, La Jolla, Calif.
Division of Ser. No. 54,424, May 26, 1987, Pat. No. 4,942,125, which is a continuation-in-part of Ser. No. 648,142, Sep. 7, 1984, Pat. No. 4,777,240, which is a continuation-in-part of Ser. No. 587,570, Mar. 8, 1984, abandoned. This application Jul. 17, 1990, Ser. No. 553,982
Int. Cl.[5] C12Q *1/70*
U.S. Cl. 435—5 **10 Claims**

1. A receptor molecule that includes an antibody combining site that specifically binds both with HBxAg and with an antigenic synthetic polypeptide selected from the group of polypeptides represented by the formulae:
(i) Gln-Leu-Asp-Pro-Ala-Arg-Asp-Val-Leu-Cys-Leu-Arg-Pro-Val-Gly;
(ii) Ser-Ala-Val-Pro-Thr-Asp-His-Gly-Ala-His-Leu-Ser-Leu-Arg-Gly-Leu-Pro-Val-Cys; and
(iii) Met-Glu-Thr-Thr-Val-Asn-Ala-His-Gln-Ile-Leu-Pro-Lys-Val-Leu-His-Lys-Arg-Thr-Leu-Gly,
wherein said receptor molecule consists of an antibody, a substantially whole antibody, a Fab fragment, or a $(Fab')_2$ fragment, and wherein said antibody combining site does not specifically bind an antigenic synthetic polypeptide represented by the formula:
(iv) Leu-Ser-Ala-Met-Ser-Thr-Thr-Asp-Leu-Glu-Ala-Tyr-Phe-Lys-Asp-Cys;
(v) Cys-Leu-Phe-Lys-Asp-Trp-Glu-Glu-Leu-Gly-Glu-Glu-Ile-Arg-Leu-Lys-Val; or
(vi) Ala-Pro-Ala-Pro-Cys-Asn-Phe-Phe-Thr-Ser-Ala.

5,183,735
METHOD AND DIAGNOSTIC TEST KIT FOR DETECTION OF ANTI-DSDNA ANTIBODIES
Luis R. Lopez, Aurora, and Marcia Sterhan, Louisville, both of Colo., assignors to Reuads Medical Products, Inc., Westminster, Colo.
Continuation-in-part of Ser. No. 315,567, Feb. 27, 1989. This application Dec. 27, 1990, Ser. No. 633,361
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 **13 Claims**

1. A diagnostic element adapted to detect the presence of anti-dsDNA antibodies in a sample specimen upon contact with said sample specimen, comprising:
a support member, selected from the group consisting of plates, test tubes, and wells;
a coating on a surface portion of said support member, said first coating consisting essentially of methylated bovine serum albumin as a constituent thereof whereby said methylated bovine serum albumin provides immobilization sites;
dsDNA antigens specific for said anti-dsDNA antibodies, said dsDNA antigens being immobilized on said coating at occupied ones of said immobilization sites; and
a blocking layer disposed on said coating, said blocking layer consisting essentially of a blocking material operative to block a majority of said immobilization sites other than the occupied ones thereof whereby said blocking layer provides a contact surface available to be contacted by said sample specimen with said contact surface having dsDNA antigens forming binding sites specific for said anti-dsDNA antibodies while being substantially free of ssDNA antigens forming binding sites; wherein said blocking layer is operative to stabilize said dsDNA antigens immobilized on the occupied ones of said immobilization sites; and wherein said contact surface has a specificity greater than sixty-two percent.

5,183,736

METHODS USING ESTROGEN RECEPTOR AS A CONSTITUTIVE TRANSCRIPTIONAL ACTIVATOR AND A REPRESSOR

Magnus Pfahl, Solana Beach, and Maty Tzukerman, San Diego, both of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Filed Mar. 30, 1990, Ser. No. 502,325
Int. Cl.[5] C12Q *1/68*
U.S. Cl. 435—6 17 Claims

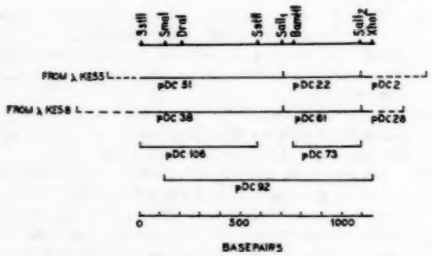
1. A method of comparatively determining the ability of a ligand to effect the constitutive activator or repressor activity of an estrogen receptor which has the constitutive activator or repressor activity and a estrogen receptor which lacks the constitutive activator or repressor activity comprising separately binding the ligand to the estrogen receptor which has the constitutive activator or repressor activity and the estrogen receptor which lacks the constitutive activator or repressor activity, determining the effect of the ligand on the activity of the estrogen receptor which has the constitutive activator or repressor activity and the estrogen receptor which lacks the constitutive activator or repressor activity, and comparing the activity.

5,183,737

REPETITIVE DNA SEQUENCE SPECIFIC FOR MYCOBACTERIUM TUBERCULOSIS TO BE USED FOR THE DIAGNOSIS OF TUBERCULOSIS

Jack T. Crawford, Atlanta, Ga.; Kathleen D. Eisenach, Little Rock, Ark.; M. Donald Cave, Little Rock, Ark., and Joseph H. Bates, Little Rock, Ark., assignors to The Board of Trustees of the University of Arkansas, Little Rock, Ark.

Division of Ser. No. 589,819, Sep. 28, 1990. This application Oct. 1, 1991, Ser. No. 769,234
Int. Cl.[5] C12G *1/68*
U.S. Cl. 435—6 5 Claims



1. A method for characterizing stains of *M. tuberculosis* complex for epidemiological studies, comprising the step of:

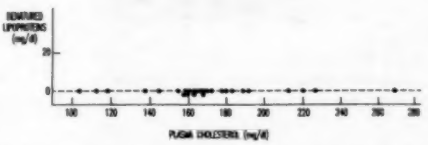
hybridizing restricted DNA from isolated stains with DNA probes of the complete, repetitive sequence, wherein said DNA probe is selected from the group consisting of the entire repetitive DNA segment in *M. tuberculosis* complex as shown in FIG. 2, SalI-BamH1 fragment, and SstII fragment.

5,183,738

KIT FOR THE DETECTION OF DENATURED LIPOPROTEINS

Masakazu Adachi, Takasaki; Toshimitu Saitou, Gunma; Kimiyo Murata, Takasaki, and Aki Tamura, Maebashi, all of Japan, assignors to Japan Immuno Research Laboratories Co., Ltd., Takasaki, Japan

Filed Sep. 27, 1989, Ser. No. 413,484
Claims priority, application Japan, Sep. 29, 1988, 63-244987
Int. Cl.[5] C12Q *1/60;* G01N *33/577*
U.S. Cl. 435—7.1 7 Claims



1. A method for detecting abnormal lipid metabolism, comprising the steps of:

contacting a sample containing apoprotein A-I, apoprotein B-100 and denatured lipoproteins with a mixture of a first affinity gel coupled with a monoclonal antibody for said apoprotein A-I and a second affinity gel coupled with a monoclonal antibody for said apoprotein B-100 to remove said apoprotein A-I and said apoprotein B-100 from said sample;

determining the amount of denatured lipoproteins in said sample; and

correlating the amount of denatured lipoproteins to abnormal lipid metabolism.

5,183,739

MONOCLONAL ANTIBODIES SPECIFIC FOR NON-A1C GLYCATED HEMOGLOBIN AND IMMUNOASSAY METHODS

Margo Cohen, New York, N.Y., assignor to Exocell, Inc., Philadelphia, Pa.

Filed Feb. 27, 1990, Ser. No. 485,878
Int. Cl.[5] C12P *21/08;* C07K *15/28;* C12N *5/20;* G01N *33/53*
U.S. Cl. 435—7.21 10 Claims

1. A hybridoma which produces an antibody which specifically binds to an epitope on glycohemoglobin comprising epsilon-D-fructosyllysine and not present on hemoglobin A_O, or hemoglobin A_{1c} or other proteins.

5,183,740

FLOW IMMUNOSENSOR METHOD AND APPARATUS

Frances S. Ligler, Potomac; Gaber Bruce P., Bethesda, both of Md.; Anne W. Kusterbeck, Falls Church, and Gregory A. Wemhoff, Manassas, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1990, Ser. No. 486,024
Int. Cl.[5] G01N *33/53, 33/569*
U.S. Cl. 435—7.32 12 Claims

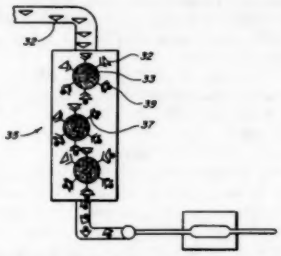
1. A method of detecting a target comprising,

(a) providing a solid phase-immobilized antibody capable of specifically binding to the target,

(b) exposing an antigen binding site of the antibody to a labelled analog of the target to form a solid phase-immobilized, labelled antigen-antibody complex,

(c) continuously flowing an aqueous medium suspected of containing the target past the solid phase-immobilized, labelled antigen-antibody complex at a flow rate allowing the target to displace the labelled analog from the labelled

antigen-antibody complex under nonequilibrium conditions, and



(d) detecting the displaced labelled analog, the amount of said displaced labelled analog being directly proportional to the concentration of said target in said medium.

5,183,741

INTEGRAL MULTILAYER ELEMENT FOR GLUCOSE ANALYSIS

Fuminori Arai, and Harumi Katsuyama, both of Asaki, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 387,397, Jul. 27, 1989, abandoned, which is a continuation of Ser. No. 262,159, Oct. 19, 1988, abandoned, which is a continuation of Ser. No. 97,304, Sep. 14, 1987, abandoned, which is a continuation of Ser. No. 660,658, Oct. 15, 1984, abandoned. This application Oct. 22, 1990, Ser. No. 603,243

Claims priority, application Japan, Oct. 13, 1983, 58-191246

Int. Cl.[5] C12Q *1/54, 1/26, 1/28;* **C12N** *11/18*

U.S. Cl. 435—14 **5 Claims**

1. An integral multilayer element for chemical analysis of glucose in a liquid sample, which comprises, in the following order:

(a) a porous spreading layer;

(b) an oxygen-permeable, protein-impermeable light-blocking layer;

(c) a layer containing glucose oxidase;

(d) an indicator layer containing peroxidase and an indication for hydrogen peroxide showing a photometrically detectable change in the presence of peroxidase and hydrogen peroxide; and

(e) a water-impermeable, light-transmissive support.

5,183,742

TEST DEVICE FOR DETECTING GLUCOSE, PROTEIN UROBILINOGEN, AND/OR OCCULT BLOOD IN BODY FLUIDS AND/OR DETERMINING THE PH THEREOF

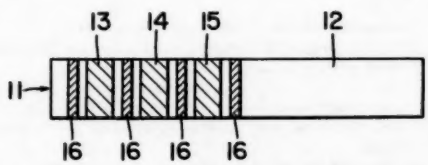
Kouichi Omoto, Kawasaki, and Takeshi Miyazaki, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 703,480, Feb. 20, 1985, abandoned. This application May 8, 1989, Ser. No. 349,950

Claims priority, application Japan, Feb. 24, 1984, 59-33787

Int. Cl.[5] C12Q *1/54*

U.S. Cl. 435—14 **5 Claims**



1. A test device for body fluids comprising a support having printed or coated on a surface thereof at least one detection region, each detection region comprising a reagent composition selected from the group of reagent compositions consisting of:

(a) a glucose detection reagent comprising a glucose oxidase, peroxidase, a peroxide oxidizable indicator, a glucose detection reagent binder and a color stabilizer which stabilizes said peroxide oxidizable indicator and a detectable product, said reagent being dissolved or dispersed in a nonaqueous solvent for the glucose detection reagent, said solvent excluding C_1 to C_2 alcohols;

(b) a protein detection reagent comprising a pH indicator, a pH buffer, a protein-adsorptive ion exchanger, and a protein detection reagent binder, said reagent being dissolved or dispersed in a non-aqueous solvent for the protein detection reagent; and

(c) a pH determination reagent comprising a pH indicator, and a pH determination reagent binder, said reagent being dissolved or dispersed in a non-aqueous solvent for the pH determination reagent; and

at least one water-retentive pattern portion formed on said surface of said support between and coplanar with each of said detection regions such that adjacent detection regions are separated by at least one water-retentive pattern portion;

wherein said support is nonadsorptive, the water retentive pattern portions have a capacity of absorbing water of at least 10 times their own weight, and spaces are provided on said support between each of said detection regions and each of said water-retentive pattern portions.

5,183,743

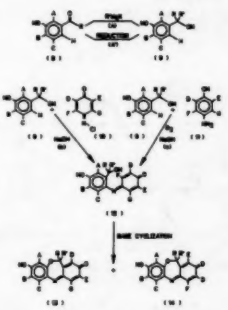
CHROMOGENIC DIBENZOXAZEPINONE AND DIBENZOTHIAZEPINONE ENZYME SUBSTRATES

Paul F. Corey, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Division of Ser. No. 364,157, Jun. 12, 1989. This application Nov. 29, 1991, Ser. No. 800,112

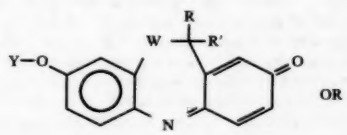
Int. Cl.[5] C12Q *1/54, 1/38, 1/00, 1/50*

U.S. Cl. 435—18 **19 Claims**



1. A method for determining a particular enzyme in a liquid test sample, comprising the steps of:

(a) contacting the test sample with a chromogenic enzyme substrate compound of the formula:



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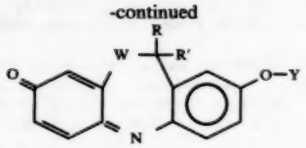


wherein W is O or S; R and R', which can be the same or different, are H, alkyl, or aryl; and Y is an enzyme-cleavable group that is

(i) capable of being cleaved from the nucleus of the enzyme substrate compound by said enzyme, or

(ii) capable of being modified by said enzyme to produce a secondary substrate compound in which Y is capable of being cleaved from the nucleus of the modified enzyme substrate compound by a secondary enzyme,

and, in the latter case (ii), the secondary substrate compound is contacted with said secondary enzyme; and

(b) measuring and correlating the resulting color generated by the cleaved nucleus of the enzyme substrate compound to the presence of said enzyme in said liquid test sample.

5,183,744

CELL HANDLING METHOD FOR CELL FUSION PROCESSOR

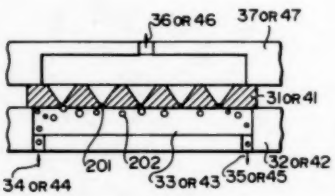
Yoshio Kawamura, Kokubunji; Shinji Tanaka, Akishima; Kazuo Sato; Kenko Uchida, both of Tokyo, and Hiroyuki Kohida, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1989, Ser. No. 425,028

Claims priority, application Japan, Oct. 26, 1988, 63-268030; Nov. 11, 1988, 63-283601

Int. Cl.[5] A01N *1/02*; C12Q *1/24*; C12M *3/02*

U.S. Cl. 435—30 **3 Claims**



1. A method for transferring biological cells to a plurality of microchambers arranged in a pattern, which comprises supplying the biological cells to a first solution in contact with a plurality of holding means including absorption ports for retaining individual biological cells, said first solution having a specific gravity which causes the biological cells to move towards said holding means; holding an individual biological cell at each of said absorption ports of said holding means; removing other cells not held by said absorption ports of said holding means by supplying a second solution, said second solution causing the other cells to move away from said holding means and transferring the held biological cells within the absorption ports of said holding means to the plurality of microchambers arranged in a pattern.

5,183,745

ADENYL CYCLASE DERIVATIVES AND THEIR BIOLOGICAL USES

Antoine Danchin; Philippe Glaser, both of Paris; Evelyne Krin, Colombes; Octavien Barzu, Massy; Daniel Ladant, Cachan, and Agnès Ullmann, Paris, all of France, assignors to Institut Pasteur, Paris, France

Filed Oct. 25, 1989, Ser. No. 426,541

Claims priority, application France, Oct. 25, 1988, 88 13951

Int. Cl.[5] C12P *21/06*; C12N *9/88, 15/00*; C07H *15/12*

U.S. Cl. 435—69.1 **18 Claims**

2. An adenyl cyclase derivative, wherein:

(a) the amino acid sequence of said derivative consists essentially of an amino acid sequence of a *Bordetella pertussis* adenyl cyclase comprising an amino acid substitution in at least one site of said derivative, wherein said sites are selected from the group consisting of amino acids 54–77 of the *Bordetella pertussis* sequence of FIG. 2 and the calmodulin binding site, and said amino acid substitution is selected from the group consisting of:

i) a replacement of a lysine residue with an amino acid selected from the group consisting of glutamine, asparagine, aspartic acid, glutamic acid, methionine, leucine, isoleucine, and valine;

ii) a replacement of a tryptophan residue with an amino acid selected from the group consisting of aspartic acid, glutamic acid, asparagine, and glutamine; and

iii) a replacement of a lysine residue as indicated in i) and a replacement of a tryptophan residue as indicated in ii).

5,183,746

FORMULATION PROCESSES FOR PHARMACEUTICAL COMPOSITIONS OF RECOMBINANT BETA-INTERFERON

Ze'Ev Shaked, Berkeley; Tracy Stewart; Susan Hershenson, both of San Francisco; James W. Thomson, Albany; Terrance Taforo, San Leandro, and Jody Thomson, Albany, all of Calif., assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 923,423, Oct. 27, 1986, abandoned. This application Sep. 29, 1987, Ser. No. 100,679

Int. Cl.[5] A61K *37/66*; C07K *3/28*

U.S. Cl. 435—69.51 **7 Claims**

1. A method of screening for one or more biocompatible non-ionic polymeric detergents or for combinations of one or more of said detergents with another solubilizing or stabilizing agent capable of solubilizing and stabilizing pharmaceutical compositions of recombinant interferon-β (IFN-β), comprising the steps of:

(a) passing extracted, purified IFN-β in sodium dodecyl sulfate (SDS) on a desalting column equilibrated in sodium laurate in an elution buffer at pH 9.0–10.0 to form an eluate;

(b) lowering the pH of the eluate to about pH 2–3.3;

(c) centrifuging and filtering the eluate to remove the precipitated sodium laurate;

(d) adding to the filtrate an effective amount of one or more of said detergents or said combination of one or more of said detergents with another solubilizing or stabilizing agent;

(e) adjusting the pH of the filtrate to 3.5 to 9.5; and

(f) allowing said filtrate to stand for about 24 hours at pH 3.5 to 9.5.

5,183,747

TYPE II RESTRICTION ENDONUCLEASE SSP4800I

Klaus Kaluza, Bad Heilbrunn; Bruno Frey, Penzberg, and Michael Jarsch, Bad Heilbrunn, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

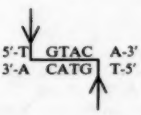
Filed Oct. 10, 1991, Ser. No. 777,759

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1990, 4032213

Int. Cl.[5] C12P *19/34;* C12N *9/22*

U.S. Cl. 435—91 **10 Claims**

1. Type II restriction endonuclease having the recognition sequence



and the cleavage site indicated by the arrows.

5,183,748

PROCESS FOR THE PREPARATION OF OLIGO- AND POLYDEOXYRIBONUCLEOTIDES

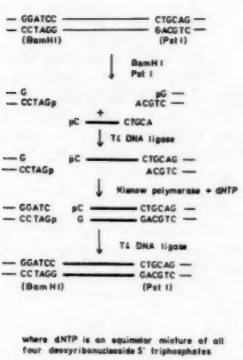
András Simoncsits; Miklós Kálmán; Csaba Kari; and Imre Cserpán, all of Szeged, Hungary, assignors to Vepex Contractor LTD., Budapest; MTA Szegedi Biologiai Kozpontja; Odesszai, both of Hungary

Filed Nov. 22, 1985, Ser. No. 800,669

Claims priority, application Hungary, Nov. 23, 1984, 4356/84

Int. Cl.[5] C12P *19/34;* C12N *15/00;* C07H *15/12*

U.S. Cl. 455—91 **10 Claims**



where dNTP is an equimolar mixture of all four deoxyribonucleoside 5' triphosphates

1. A process for the preparation of oligo- and polydeoxyribonucleotides comprising inserting a single-stranded DNA piece into a cloning vector, said vector containing a number of closely located recognition sequences of restriction enzymes giving a 3'-protruding end, each present only once in the said vector and which, following cleavage with two corresponding restriction enzymes, produces a linearized vector containing a 5'-protruding end and a 3'-protruding end, said single-stranded DNA piece being inserted into the linearized vector such that, after ligation, the linear vector containing said single-stranded DNA contains 5'-protruding regions at both ends, and synthesizing the complementary strand of said single-stranded DNA piece entirely enzymatically in the presence of deoxyribonucleoside 5'-triphosphates in said cloning vector.

5,183,749

MICROBIAL PROCESS FOR THE PREPARATION OF MILBEMYCIN DERIVATIVES

Gerado Ramos, Arlesheim; Oreste Ghisalba, Reinach; Hans-Peter Schär, Aesch; Bruno Frei, Liestal; Peter Maienfisch, Aesch, and Anthony C. O'Sullivan, Basel, all of Switzerland, assignors to Sankyo Company, Ltd., Tokyo, Japan

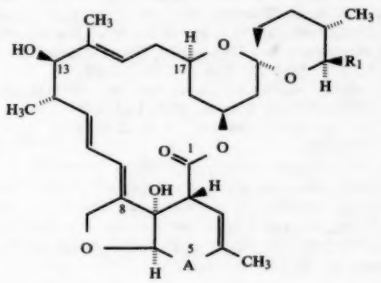
Continuation of Ser. No. 147,956, Jan. 25, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 496,183

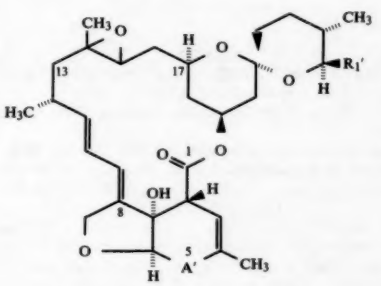
Claims priority, application Switzerland, Feb. 4, 1987, 395/87

Int. Cl.[5] C12P *17/18, 33/06;* C12N *1/14, 1/20*

U.S. Cl. 435—119 **11 Claims**

1. A one-step microbial process for the preparation of 13β-hydroxy-milbemycins or 14,15-epoxy-milbemycins of formulas I or II:

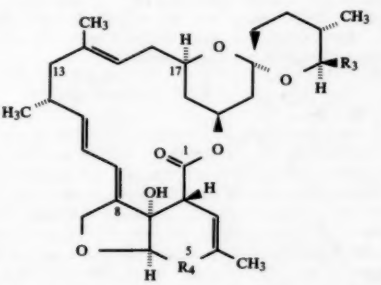




in which

R_1 and R_1' are methyl or isopropyl and A and A' are —CH-(OH)—, or R_1 and R_1' are ethyl and A and A' are —CH-(OH)— or —C(=N~OH)—,

or a mixture of compounds of formulas I and II, which process comprises bringing a milbemycin of formula III



dissolved in a liquid phase, in which R_3 is R_1 or R_1' and R_4 is A or A', and R_1, R_1', A and A' have the meanings given for

formulas I and II, into contact with a microorganism selected from the group consisting of *Streptomyces diastatochromogenes* ATCC 31561, *Streptomyces violascens* ATCC 31560 and *Aspergillus niger* ATCC 20567 that is capable of 13β-hydroxylation or 14,15-epoxidation, or of both reactions, for a period of time that is sufficient for carrying out the 13β-hydroxylation or 14,15-epoxidation reaction or both reactions, and isolating the reaction product.

5,183,750

PROCESSES FOR THE PRODUCTION OF PHOSPHATIDIC ACID

Tsutomu Nishide; Daisuke Yasumura; Yoshinobu Nakajima, all of Ibaraki; Akiko Onodera, Hokkaido; Takuji Yasukawa, Ibaraki; Hirokazu Kokumai, Ibaraki; Tomoshige Umeda, Ibaraki; Seiji Nomura, Chiba, and Hideki Mori, Ibaraki, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 25, 1990, Ser. No. 528,982

Claims priority, application Japan, May 26, 1989, 1-133653; May 26, 1989, 1-133654; May 26, 1989, 1-133655

Int. Cl.[5] C12P *7/64, 7/62, 9/00;* **C12N** *9/16*

U.S. Cl. 435—134 **26 Claims**

1. A process for producing phosphatidic acid which comprises treating phospholipids with an enzyme capable of hydrolyzing a phospholipid into phosphatidic acid and a nitrogen-containing base and another enzyme capable of hydrolyzing a phospholipid into a diglyceride and a phosphoryl base; and recovering said phosphatidic acid.

5,183,751

STABILIZATION OF PEROXIDASE SOLUTIONS BY PARA-AMINO-SALICYCLIC ACID

Roland F. Maes, Bildhauerhof 34, Rosheim 67190 Mutzig, France

Continuation-in-part of Ser. No. 326,790, Mar. 21, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,537

Claims priority, application France, Apr. 20, 1988, 85 05243

Int. Cl.[5] C12N *9/96*

U.S. Cl. 435—188 **13 Claims**

1. A method for stabilizing the enzymatic activity of horseradish peroxidase contained in an aqueous medium which comprises incorporating in said medium a stabilizing amount of para-amino-salicylic acid (PASA) or water-soluble salt thereof.

5,183,752

HEAT-LABILE PHOSPHATASE

John P. Markwell, Lincoln, Nebr.; Wayne K. Versaw, Madison, Wis.; John C. Osterman, Waverly, and Philip M. Kelley, Lincoln, both of Nebr., assignors to Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Oct. 29, 1990, Ser. No. 605,539

Int. Cl.[5] C12N *9/16, 1/00;* **C12P** *19/34*

U.S. Cl. 435—196 **1 Claim**

1. A purified, heat-labile, phosphatase from *Aspergillus niger*, said phosphatase having a molecular weight of about 80,000 daltons, an isolectric point of about pI 4.6, and a half-life of about 5.3 minutes at about 50° C., exhibiting optimal enzymatic activity under neutral to slightly alkaline conditions of between about pH 7.0 to pH 8.5, removing the 5'-terminal phosphate group from a linear DNA polymeric molecule, and not the phosphate group from a monomeric adenosine triphosphate (ATP) molecule, and consisting of two identical pholypeptides subunits, said subunits having a molecular weight of about 37,000 daltons each.

5,183,753

PREPARATION OF XYLANASE BY CULTIVATING *THERMOMYCES LANUGINOSUS* DSM 5826 IN A MEDIUM CONTAINING CORN COBS

Wolfgang Wizani, Steyr; Hermann Esterbauer; Walter Steiner, both of Graz, all of Austria, and Joseph Gomes, Dhaka, Bangladesh, assignors to Voest-Alpine Industrienlagenbau Gesellschaft m.b.H., Linz, Austria

Filed May 8, 1991, Ser. No. 696,943

Claims priority, application Austria, May 8, 1990, 1030/90

Int. Cl.[5] C12N *9/00, 9/24, 9/26, 1/14*

U.S. Cl. 435—201 **5 Claims**

1. A process for the preparation of xylanase, comprising cultivating *Thermomyces lanuginosus* which contains corn cobs.

5,183,754

METHOD FOR PRODUCTION OF HUMAN TISSUE TYPE PLASMINOGEN ACTIVATOR

Shoichiro Miyahara, Yokohama; Atsunori Shindo, Kamakura; Maki Suzuki; Nobumi Kusuhara, both of Yokohama, and Nobuyoshi Makiguchi, Fujisawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 412,818

Claims priority, application Japan, Oct. 4, 1988, 63-249081; Dec. 16, 1988, 63-316118

The portion of the term of this patent subsequent to Sep. 29, 2009, has been disclaimed.

Int. Cl.[5] C12N *9/64, 9/48*

U.S. Cl. 435—226 **4 Claims**

1. A method for producing human tissue type plasminogen activator using cells, wherein the human tissue type plasminogen activator is produced in parallel with growth of the cells in a cell culture medium in which bicarbonate ion equivalent to 3 to 10 g/l of $NaHCO_3$ based on the true volume of the medium is supplied to said cell culture medium to increase the osmotic pressure of the medium to a range of 350 to 520 milliosmoles/-liter.

5,183,755

ANTI-HUMAN PAPILLOMAVIRUS MONOCLONAL ANTIBODY, HYBRIDOMA PRODUCING THE SAME AND PROCESS FOR PREPARING THE SAME

Hiroshi Ohmoto, Osaka, and Seiichi Iwamoto, Kobe, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 482,717

Claims priority, application Japan, Feb. 21, 1989, 1-40714

Int. Cl.[5] C12N *5/22;* **C12P** *21/08;* **C07K** *15/28*

U.S. Cl. 435—240.27 **2 Claims**

1. An anti-human papillomavirus (HPV) monoclonal antibody which is produced by a hybridoma deposited under the accession number FERM BP-2278.

5,183,756

MONOCLONAL ANTIBODY (D612) HAVING SELECTIVE REACTIVITY FOR GASTROINTESTINAL CARICINOMAS AND METHOD FOR EMPLOYING THE SAME

Jeffrey Schlom, Potomac, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 234,130, Aug. 19, 1988, abandoned. This application Jun. 18, 1991, Ser. No. 715,748

Int. Cl.[5] C12N *5/20;* **C07K** *15/28;* **A61K** *39/395*

U.S. Cl. 435—240.27 **19 Claims**

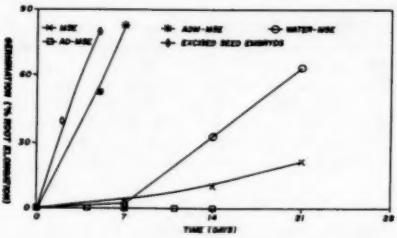
1. A hybridoma assigned A.T.C.C. Accession No. HB 9796 which produces the monoclonal antibody designated D612 which immunologically binds to human gatrointestinal cancers and normal gastrointestinal epithelium, and not other cancers or other normal human tissues.

5,183,757

PROCESS FOR THE PRODUCTION, DESICCATION AND GERMINATION OF CONIFER SOMATIC EMBRYOS

Dane R. Roberts, Vancouver, Canada, assignor to British Columbia Research Corporation, Vancouver, Canada

Filed Aug. 1, 1989, Ser. No. 388,598
Int. Cl.[5] C12N *5/00;* A01C *1/06*
U.S. Cl. 435—240.49 5 Claims



1. A process for propagation of spruce somatic embryos which includes the steps of differentiating spruce somatic embryos in contact with a growth medium containing abscisic acid, separating the somatic embryos from said medium, and germinating the somatic embryos, characterized in that the embryos are matured on said medium and are partially dried prior to germination by exposing mature embryos separated from the said medium to an atmosphere having from greater than 85% up to 99% humidity.

5,183,758

PRODUCTION OF 7-CHLORO-3-METHOXY-2'-N-METHYLTETRACYCLINE WITH *ACTINOMADURA BRUNEA* ATCC 39216

Ann C. Horan, Summit, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 763,740, Aug. 8, 1985, abandoned. This application May 23, 1990, Ser. No. 528,006
Int. Cl.[5] C12N *1/20;* C12P *29/00;* A61K *31/65*
U.S. Cl. 435—252.1 1 Claim

1. A biologically pure culture of the microorganism *Actinomadura brunnea* ATCC 39216, said culture being capable of producing 7-chloro-8-methoxy-2'-N-methyltetracycline in a recoverable quantity upon fermentation, under aerobic conditions in an aqueous medium containing assimilable sources of nitrogen and carbon.

5,183,759

RECOMBINANT RHIZOBIUM BACTERIA INOCULANTS

Eric W. Triplett, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 358,744, May 30, 1989, abandoned. This application May 22, 1991, Ser. No. 707,245
Int. Cl.[5] C12R *1/41;* C12P *21/00, 21/04;* C12N *15/00*
U.S. Cl. 435—252.2 2 Claims

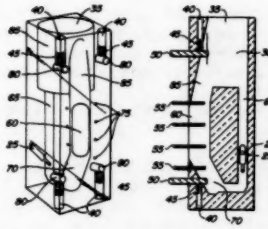
1. A recombinant Rhizobium bacterium that is capable of assisting in the formation of nitrogen fixation nodules on at least some plants, the bacterium having a foreign DNA sequence inserted in its natural bacterial genome expressively coding for trifolitoxin production, the foreign DNA sequence also coding for resistance to trifolitoxin, said trifolitoxin being a rhizobial proteinaceous material that is encoded for by a nucleotide sequence present in a 4.4 kb DNA fragment of *R. leguminosarum* bv. *trifolii* T24 that is in a pTFX1 portion of ATCC 67990, and said DNA sequence coding for resistance to trifolitoxin having a nucleotide sequence that is present in said 4.4 kb DNA fragment of *R. leguminosarum* bv. *trifolii* T24 that is in a pTFX1 portion of ATCC 67990, wherein the bacterium is selected from the group consisting of *Rhizobium leguminosarum, Rhizobium fredii,* and *Rhizobium meliloti.*

5,183,760

APPARATUS FOR IN VITRO DETERMINATION OF SUBSTANCES ACROSS MEMBRANES, BIOLOGICAL TISSUES, OR CELL CULTURES

Stephanie A. Sweetana, and George M. Grass, both of 101 First St., Los Altos, Calif. 94022

Continuation of Ser. No. 354,479, May 19, 1989, abandoned. This application Apr. 12, 1991, Ser. No. 685,167
Int. Cl.[5] C12H *1/12;* G01N *15/08, 13/04*
U.S. Cl. 435—285 15 Claims



1. In a diffusion cell block including a pair of half cells having aligned openings for holding a tissue section or membrane therebetween, wherein the improvement comprises forming each half cell as a rectangular block having a reservoir opening formed in one end and a recirculation path entirely within the block from the reservoir past the aligned opening, whereby a volume of fluid in the block can be recirculated past the aligned opening without flowing outside of the block.

5,183,761

METHOD OF MAKING CALIBRATION SOLUTION FOR VERIFYING CALIBRATION AND LINEARITY OF VERTICAL PHOTOMETERS

Mary J. Freeman, and Gary M. Freeman, both of 1795 St. Andrews Dr., Palm City, Fla. 34990

Filed Jul. 21, 1989, Ser. No. 383,938
Int. Cl.[5] G01N *31/00;* G01D *18/00;* G12B *13/00*
U.S. Cl. 436—8 9 Claims

1. A method of making a test kit to be used for taking vertical photometric measurements comprising:

(1) providing a control solution having at least one reagent and a wetting agent therein, provided in at least one vessel, said control solution having predetermined and predictable physical characteristics, said wetting agent forming a predetermined meniscus within said vessel,

(2) drying said solution to obtain a dried residue within said vessel having a pre-dispensed amount of said reagent, wherein said dried residue may be stored for subsequent use,

(3) reconstituting said dried residue using an amount of an activator to reform said control solution such that said reformed control solution will have substantially equivalent physical characteristics to said control solution provided in step one, including substantially reforming said predetermined meniscus in said vessel, such that said reformed control solution may be used to obtain accurate measurements based upon the pre-dispensed amount of said reagent.

5,183,762

COPPER CONTAINING REAGENT FOR THE DETECTION AND DETERMINATION OF BILIRUBIN IN THE URINE

Franco Meiattini, Siena, Italy, assignor to Diesse Diagnostica Senese S.R.L., Milan, Italy

Filed Jun. 27, 1990, Ser. No. 544,599

Claims priority, application Italy, Sep. 21, 1989, 21789 A/89

Int. Cl.[5] G01N *21/78, 33/72*

U.S. Cl. 436—97 **12 Claims**

1. A reagent for the detection and determination of bilirubin in urine, consisting essentially of a buffer suitable to maintain the pH of the reagent between 3 and 7 and inert to cupric ions, an aromatic compound selected from the group consisting of sulfanilic acid and sulfanilamide, a cupric soluble salt and an alkaline metal nitrite.

5,183,763

COMPOSITION AND METHOD FOR DETECTING VAPOR AND LIQUID REACTANTS

William A. Mallow, Helotes, and Jerome J. Dziuk, Jr., San Antonio, both of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jun. 6, 1990, Ser. No. 534,198

Int. Cl.[5] G01N *33/00, 33/62*

U.S. Cl. 436—106 **12 Claims**

1. A composition for detecting nitrogen containing compounds of the class comprising amines and ammonia, consisting essentially of ethyl cellulose, at least 3.0% by weight amorphous silica, solvent and an indicator.

5,183,764

QUANTITATIVE ANALYSIS FOR DIABETIC CONDITION PREDICTOR INVOLVING CHIRO-INOSITOL

Alison S. Kennington, Laurel, Md., and Joseph Larner, Charlottesville, Va., assignors to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 476,953, Feb. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 320,485, Mar. 8, 1989, abandoned, which is a continuation of Ser. No. 751,628, Aug. 26, 1991. This application Apr. 21, 1992, Ser. No. 870,771

Int. Cl.[5] G01N *33/00, 33/49, 33/493*

U.S. Cl. 436—131 **3 Claims**

1. A method for screening mammalian individuals to determine whether the individual exhibits insulin-resistance associated with a diabetic state, comprising:

obtaining a sample from said individual, said sample being selected from the group consisting of a serum sample, and a urine sample,

determing the concentration of chiro-inositol (CI) in said sample,

correlating said concentration with preestablished values indicating insulin-resistance in mammalian individuals,

wherein said preestablished values are less than about 0.3 micrograms/ml for urinary CI concentrations and less than about 0.03 micrograms/ml for serum CI concentrations being indicative of insulin-resistance.

2. A method for screening mammalian individuals to determine whether said individuals exhibit presymptomatic insulin-resistance, comprising:

obtaining a sample from said individual, said sample being selected from the group consisting of a serum sample and a urine sample,

determing the concentration of chiro-inositol (CI) in said individual,

correlated said CI concentration with preestablished values indicting presymptomatic insulin-resistance in mammalian individuals,

wherein said preestablished values are between about 0.3–1.0 micrograms/ml for urinary CI concentrations and between about 0.03–0.1 micrograms/ml for CI serum concentrations being indicative of presymptomatic insulin-resistance in mammalian individuals.

3. A method for screening mammalian individuals to determine whether said individuals exhibit insulin-resistance, comprising:

obtaining a sample from said individual, said sample being selected from the group consisting of a serum sample and a urine sample,

determing the concentration of chiro-inositol in said individual,

correlating said chiro-inositol concentration with preestablished values indicating insulin-resistance in mammalian individuals,

wherein said preestablished values are between about 0.3–1.0 micrograms/ml for urinary chiro-inositol concentrations and between about 0.03–0.1 micrograms/ml for chiro-inositol serum concentrations being indicative of insulin-resistance in mammalian individuals.

5,183,765

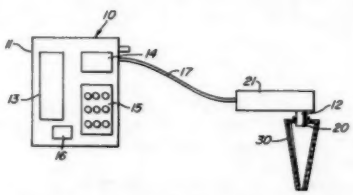
MEANS AND METHOD OF MEASURING AND DISPENSING

Humayun Qureshi, Wayland, and Donald Schwartz, Marblehead, both of Mass., assignors to DRD Diluter Corporation, Danvers, Mass.

Filed Oct. 11, 1990, Ser. No. 595,975

Int. Cl.[5] B01L *3/02*

U.S. Cl. 436—180 **13 Claims**



1. A method of metering and dispensing required amounts of liquid by the use of an aspiration tip defining a tip chamber having a predetermined total volume, interconnected with an aspiration probe carrying a conduit which is interconnected with a probe liquid volume available from a reservoir,

said method comprising flowing a selected amount of probe liquid from said probe liquid volume through said conduit in said probe to fill a preselected volume of said chamber with probe liquid, less than said total volume, but of a volume large enough to substantially fill said chamber along with supplemental liquid to be used in said chamber,

aspirating a portion of said probe liquid and a predetermined first volume of first liquid to be metered; and,

dispensing said first liquid.

5,183,766

DISPERSION POLYMERS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Wolfgang Kapmeyer, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Division of Ser. No. 39,107, Apr. 16, 1987, Pat. No. 4,962,046. This application Jun. 22, 1990, Ser. No. 542,049

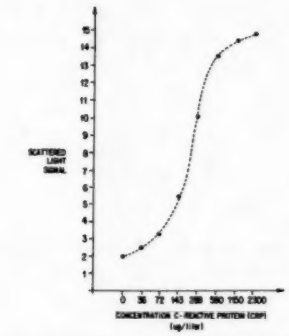
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613111

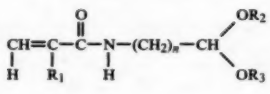
Int. Cl.[5] G01N *33/546;* **C12Q** *1/00*

U.S. Cl. 436—533 **16 Claims**

1. A process for the preparation of a dispersion polymer, which comprises the steps of first preparing a latex of a non-film-forming seed polymer having an incompletely polymerized monomer content of 5 to 50% by weight by carrying out the polymerization so that only 30% to 90% of the monomer

present is polymerized completely, subsequently separating off the monomers not bonded to the polymer and then polymerizing a monomer mixture which contains at least one compound of the formula I containing acetal groups





I

wherein n is 1—6;

R_1 is H or CH_3; and

R_2 and R_3 are identical or different, where

R_2 and R_3 are $(CH_2)_m$—CH_3, and m is 0—7, or

in which X, Y and Z are $(CH_2)_p$—CH_3 and P is 1—3, where X, Y and Z are identical or different, or R_2 and R_3 are an aryl radical,

and, in addition, up to 30% by weight, based on the mixture, of monomrs selected from acrylic acid, methacrylic acid, crotonic acid and mixtures thereof, and a further up to 30% by weight, again based on the total mixture, of carbocyclic aromatic vinylidene monomers in the presence of the seed polymer thus obtained.

5,183,767

METHOD FOR INTERNAL GETTERING OF OXYGEN IN III-V COMPOUND SEMICONDUCTORS

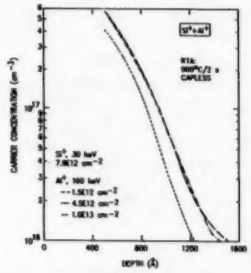
Herve Baratte, Hofheim, Fed. Rep. of Germany; Joel P. de Souza, Porto Alegre, Brazil, and Devendra K. Sadana, Plesantville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1991, Ser. No. 655,512

Int. Cl.[5] H01L *21/306*

U.S. Cl. 437—11 **22 Claims**

1. A method of manufacturing a III-V semiconductor composition containing minor amounts of oxygen as an impurity, comprising placing an n-dopant by ion implantation in said III-V compound in an amount from about 4E12 cm^{-2} to less than about 2E13 cm^{-2} to form a dopant region and placing an oxygen reactive element by ion implantation in said III-V compound in an amount from about 1.5E12 cm^{-2} to about 4.5 E12 cm^{-2} to form an oxygen reactive element region so that



said regions are separated from one another in said III-V compound.

5,183,768

METHOD OF FABRICATING SEMICONDUCTOR DEVICE BY FORMING DOPED REGIONS THAT LIMIT WIDTH OF THE BASE

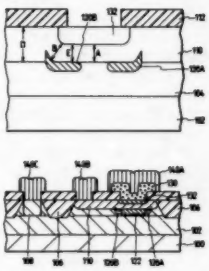
Shuichi Kameyama, Itami; Hiroshi Shimomura, and Kazuya Kikuchi, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 503,603, Apr. 3, 1990, abandoned. This application Jul. 15, 1991, Ser. No. 729,965

Claims priority, application Japan, Apr. 4, 1989, 1-85411

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—26 **5 Claims**



1. A method of fabricating a semiconductor device, comprising the steps of:

forming a first semiconductor region of a first conduction type, the first semiconductor region forming a transistor collector;

forming a second semiconductor region on the first semiconductor region, the second semiconductor region being of a second conduction type and forming a transistor base;

forming a mask on the second semiconductor region, the mask having an opening for a transistor emitter;

forming a third semiconductor region in an emitter-forming area within the second semiconductor region, the third semiconductor region being of the first type and forming a transistor emitter; and

implanting ions into the first and second semiconductor regions via the opening along a direction inclined with respect to a surface of the second semiconductor region and thereby forming a fourth semiconductor region of the first conduction type, the fourth semiconductor region having a main portion and an upper portion, wherein the main portion extends in a part of the first semiconductor region below an edge of the emitter-forming area within the second semiconductor region, the upper portion ex-

tends from the main portion into a part of the second semiconductor region, the upper portion not reaching the upper surface of the second semiconductor region, and the surface of the upper portion is shaped so as to conform to the edge of the emitter-forming area to limit a width of the transistor base.

5,183,769

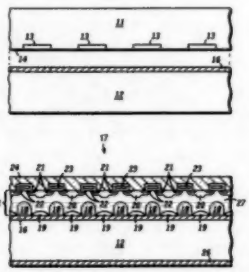
VERTICAL CURRENT FLOW SEMICONDUCTOR DEVICE UTILIZING WAFER BONDING

Robert E. Rutter, Tempe, and Frank S. d'Aragona, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1991, Ser. No. 696,405

Int. Cl.[5] H01L *29/70*

U.S. Cl. 437—31 **12 Claims**



7. A method of forming a vertical current flow semiconductor device that has a minority carrier injection diode comprising:

providing an active wafer of a first conductivity type having a first surface and a plurality of predeposited dopant regions on a second surface of the active wafer;

providing a substrate having a wafer bonding adhesive layer on a first surface of the substrate;

forming an intermediate contact layer by wafer bonding the adhesive layer to the second surface of the active wafer wherein the wafer bonding facilitates forming the minority carrier injector diodes by diffusing the predeposited dopants into the second surface of the active wafer; and

forming an ohmic contact to the second surface of the substrate.

5,183,770

SEMICONDUCTOR DEVICE

Akitsu Ayukawa, and Shigeo Onishi, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 27, 1992, Ser. No. 842,515

Claims priority, application Japan, Mar. 4, 1991, 3-037585; May 27, 1991, 3-120805; Feb. 3, 1992, 4-017754

Int. Cl.[5] H01L *21/336, 21/324*

U.S. Cl. 437—41 **14 Claims**

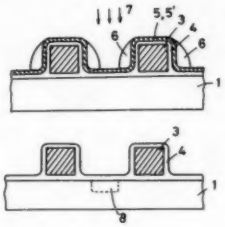
1. A method for fabricating a semiconductor device, comprising the steps of:

(a) forming a gate electrode on a semiconductor silicon substrate with a gate oxide interposed therebetween;

(b) depositing an insulation film to entirely cover the substrate and the gate electrode, followed by depositing a polysilicon or amorphous silicon layer on the insulation film;

(c) forming side walls of SiO_2 on lateral sides of the gate electrode covered with the insulation film and the polysilicon or amorphous silicon layer, followed by ion implantation; and then

(d) subjecting the substrate to a heat treatment at a first temperature for forming a diffusion region after removal of the side walls, stacking an interlayer insulator over the substrate including the gate electrode after removal of the polysilicon or amorphous silicon layer, and then subjecting the substrate to a heat treatment at a second tempera-



ture higher than the first temperature for planarizing the interlayer insulator.

5,183,771

METHOD OF MANUFACTURING LDDFET HAVING DOUBLE SIDEWALL SPACERS

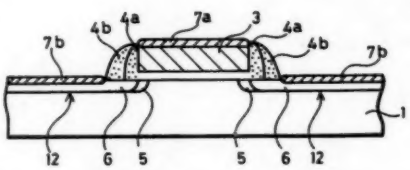
Katsuyoshi Mitsui, and masahide Inuishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 462,536, Jan. 3, 1990, Pat. No. 5,089,865. This application Jul. 19, 1991, Ser. No. 732,541

Claims priority, application Japan, Jan. 7, 1989, 1-1602

Int. Cl.[5] H01L *21/336*

U.S. Cl. 437—44 **11 Claims**



1. A method for manufacturing a MIS semiconductor device having a salicide structure and a LDD structure, said method comprising the steps of:

forming a gate insulating film on a main surface of a semiconductor substrate;

forming a uniform thickness of polysilicon on said gate insulating film;

patterning said polysilicon of uniform thickness into a gate electrode of uniform thickness;

introducing impurities into said semiconductor substrate using the patterned polysilicon gate electrode as a mask to form an impurity region with relatively low concentration;

forming a first insulating film on the main surface of said semiconductor substrate and on the surface of said patterned polysilicon gate electrode;

patterning said first insulating film to form a first sidewall spacer on a sidewall of said patterned polysilicon gate electrode by performing anisotropic etching of said first insulating film;

introducing impurities into said semiconductor substrate using said polysilicon gate electrode and said first sidewall spacer as a mask to form an impurity region with relatively high concentration; then

forming a second insulating film on the surface of said semiconductor substrate, said first sidewall spacer and said polysilicon gate electrode;

patterning said second insulating film to form a second sidewall spacer on a sidewall of said first sidewall spacer by performing anisotropic etching on said second insulating film; and

forming a refractory metal silicide layer on the surface of

said semiconductor substrate and on an upper surface of said gate electrode.

5,183,772

MANUFACTURING METHOD FOR A DRAM CELL

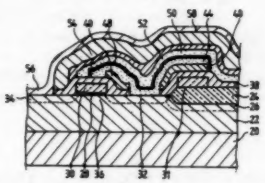
Dae-je Jin; Kwang-byeog Seo, both of Seoul, and Tae-young Jeong, Kyunggi, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Continuation of Ser. No. 489,819, Mar. 9, 1990. This application Jan. 22, 1992, Ser. No. 824,885

Claims priority, application Rep. of Korea, May 10, 1989, 89-6207[U]

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—52 20 Claims



1. A manufacturing method for a DRAM cell provided with a stacked capacitor, comprising:

defining a switching transistor region by forming a field oxide layer on a first conduction type semiconductor substrate;

forming source and drain regions of a second conduction type different from said first conduction type in said switching transistor region;

forming respective first conductive layers on a part of said field oxide layer and on a gate oxide layer over a channel region within said switching transistor region;

forming a first insulating layer on said first conductive layers and on the surface of said semiconductor substrate;

forming a second conductive layer on the whole surface of said first insulating layer, and then, removing portion of said second conductive layer which are over said channel region and said drain region;

forming an opening for exposing a part of said source region;

forming a third conductive layer over remaining portions of said second conductive layer and over parts of said substrate, to provide a gentle slope at least from an edge of overlap of said second conductive layer and said third conductive layer to a region immediately adjacent that edge and above the first conductive layer over said channel region;

etching to remove portions of said second and third conductive layers;

forming a dielectric layer over remaining portions of said third conductive layer to serve as a dielectric medium of said capacitor; and

forming a fourth conductive layer on both said first insulating layer and said dielectric layer.

5,183,773

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE INCLUDING SUCH INPUT PROTECTION TRANSISTOR

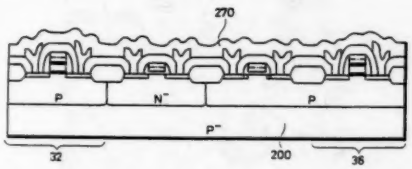
Kazuaki Miyata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 746,187, Aug. 15, 1991, which is a continuation of Ser. No. 506,614, Apr. 10, 1990, abandoned. This application Jan. 6, 1992, Ser. No. 817,190

Claims priority, application Japan, Apr. 13, 1989, 1-93707; Apr. 4, 1990, 2-91262

Int. Cl.[5] H01L *21/70*

U.S. Cl. 437—52 1 Claim



1. A method of manufacturing a semiconductor device in which an internal circuit including a memory device and a transistor having an LDD structure, and an input protection device for protecting said internal circuit are formed on one semiconductor substrate, comprising the steps of:

forming an insulator film on a surface of said semiconductor substrate;

forming a first conductor film as a gate electrode on said insulator film in a region where said memory device is to be formed and in a region where said input protection device is to be formed;

forming an insulator film on said first conductor film;

forming a second conductor film as a gate electrode on insulator film on said first conductor film and on said insulator film in said region where said transistor is to be formed;

forming a resist film on said second conductor film corresponding to said gate forming region in said memory device forming region and in said input protection device forming region, forming said resist film on the overall surface of said second conductor film in said transistor forming region, and then etching with said resist film used as a mask, thereby forming a gate electrode formed of a plurality of conductor layers in said memory device forming region and in said input protection device forming region;

implanting high concentration impurity ions into the surface of said semiconductor substrate, with said gate electrode and said second conductor film in said transistor forming region used as masks, thereby forming impurity regions to be source and drain regions in said memory device forming region and in said input protection device forming region;

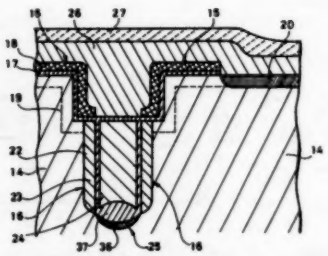
covering the overall surfaces of said memory device forming region and said input protection device forming region with a resist film, forming said resist film on said second conductor film corresponding to a gate forming region in said transistor forming region, and then etching with said resist film used as a mask, thereby forming a gate electrode in said transistor forming region; and

implanting low concentration impurity ions into the surface of said semiconductor substrate, with said resist film and said gate electrode in said transistor forming region used as masks, forming a sidewall at peripheries of said gate electrode, and then implanting high concentration impurity ions with said sidewall used as a mask, thereby forming source and drain impurity regions having the LDD structure in said transistor forming region.

5,183,774
METHOD OF MAKING A SEMICONDUCTOR MEMORY DEVICE

Shinichi Satoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 637,434, Jan. 4, 1991, abandoned, which is a division of Ser. No. 261,022, Oct. 20, 1988, Pat. No. 5,027,173. This application Dec. 16, 1991, Ser. No. 807,659
Claims priority, application Japan, Nov. 17, 1987, 65-291337
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **13 Claims**



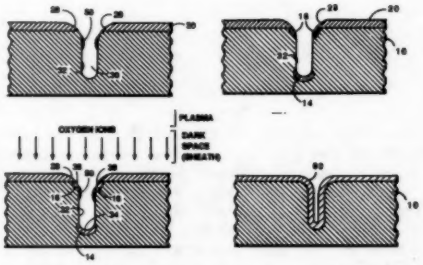
1. A method for manufacturing a semiconductor memory device on a semiconductor substrate comprising the steps of:
forming first and second pairs of substantially parallel trenches in said semiconductor substrate, said first pair of trenches arranged substantially orthogonal to said second pair of trenches thereby defining a rectangular block in said substrate;
forming a passive element region on bottom portions of said trenches;
forming first and second gate regions spaced apart on a major surface of said substrate along opposite side wall surfaces of said block formed by said parallel trenches, said first and second gate regions including respective first and second gate electrodes formed in said trenches along said opposite side wall surfaces and extending out of said trenches, parallel to said substrate, said first and second gate regions formed spaced apart on said major surface and electrically isolated from each other; and
forming a source/drain region common to said first and second gate regions on said major surface.

5,183,775
METHOD FOR FORMING CAPACITOR IN TRENCH OF SEMICONDUCTOR WAFER BY IMPLANTATION OF TRENCH SURFACES WITH OXYGEN

Karl B. Levy, Los Altos, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 23, 1990, Ser. No. 468,521
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—60 **12 Claims**

1. A process for forming a capacitor in a trench in a surface of a silicon wafer wherein said silicon wafer comprises one electrode of said capacitor which consists essentially of:
(a) forming a mask layer having an opening therein on said surface of said silicon wafer;
(b) placing said masked silicon wafer in an RIE etch apparatus;
(c) anisotropically RIE etching a trench in said silicon wafer through said mask opening on said wafer in said RIE apparatus;
(d) selectively anisotropically implanting oxygen atoms into a region of said wafer adjacent a curved bottom surface of said trench and into regions of said wafer adjacent top corner surfaces of said trench in said same RIE etch apparatus;
(e) then removing, from side surface of said trench, etch residues remaining from said etching step;
(f) thereafter growing an oxide layer on the surfaces of said trench which will serve as the dielectric of said capacitor by the steps of:
(i) heating said silicon wafer to a temperature with a range of from about 900° C. to about 1100° C.;
(ii) exposing said silicon wafer to a gaseous source of oxygen while maintaining said silicon wafer within said temperature range; and
(iii) continuing to expose said silicon wafer to said gaseous

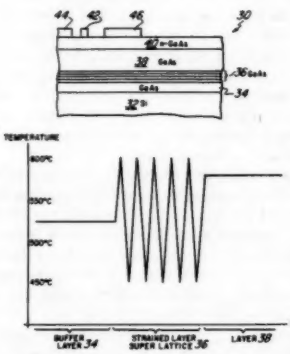


source of oxygen at said temperature for a period of from about 20 minutes to about 60 minutes;
whereby sufficient activation energy, in the form of thermal energy, will be supplied to the implanted wafer to permit the silicon in said silicon wafer to form Si-O bonds within said implanted oxygen atoms in said selected oxygen-implanted regions of said wafer; and
(g) filling said trench with a conductive material capable of forming the other electrode of said capacitor.

5,183,776
HETEROEPITAXY BY GROWTH OF THERMALLY STRAINED HOMOJUNCTION SUPERLATTICE BUFFER LAYERS

Jhang W. Lee, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 912,028, Sep. 26, 1986, abandoned. This application Aug. 3, 1989, Ser. No. 390,472
Int. Cl.[5] H01L *21/203, 21/205*
U.S. Cl. 437—110 **6 Claims**



1. A method for heteroepitaxial growth of semiconductors, comprising the steps of:
(a) providing a substrate of a first semiconductor material;
(b) growing a first layer of a second semiconductor material on said substrate at a first temperature;

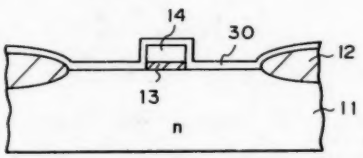
(c) growing a second layer of said second semiconductor material on said first layer at a second temperature differing from said first temperature;
(d) growing a third layer of said second semiconductor material on said second layer at said first temperature;
(e) growing a fourth layer of said second semiconductor material on said third layer at said second temperature;
(f) said first, second, third, and fourth layers each sufficiently thin to accommodate strain and together forming a strained layer superlattice;
(g) growing a fifth layer of said second semiconductor material on said superlattice.

5,183,777

METHOD OF FORMING SHALLOW JUNCTIONS

Masahiko Doki, Sagamihara, and Michiko Takei, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 629,174, Dec. 19, 1990, abandoned, which is a continuation of Ser. No. 290,951, Dec. 28, 1988, abandoned. This application Sep. 13, 1991, Ser. No. 759,767
Claims priority, application Japan, Dec. 30, 1987, 62-335720; Apr. 28, 1988, 63-104018; Jul. 8, 1988, 63-171359
Int. Cl.[5] H01L *21/00, 21/02, 21/225, 21/265*
U.S. Cl. 437—160 **11 Claims**



1. A method of forming a shallow junction comprising the steps of:
forming a film of a hydrogen compound of an element selected from the group consisting of boron, phosphorus and arsenic and having a thickness of from several atom layers to 1000 Å on a silicon layer, without impurities substantially penetrating said silicon layer by depositing said compound at a temperature of up to 150° C. and an accelerating energy of up to 20V; and
annealing the film under conditions sufficient to form an impurity region having a depth of 1000 Å or less and having an impurity concentration of 10^{18} to 10^{21} in the surface layer of the silicon layer.

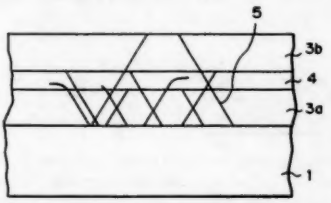
5,183,778

METHOD OF PRODUCING A SEMICONDUCTOR DEVICE

Kanetake Takasaki, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 615,970, Nov. 20, 1990, Pat. No. 5,107,317. This application Dec. 30, 1991, Ser. No. 814,157
Claims priority, application Japan, Nov. 20, 1989, 1-299758
Int. Cl.[5] H01L *21/20, 21/203, 21/205*
U.S. Cl. 437—132 **5 Claims**

1. A method of producing a semiconductor device, comprising the steps of:
preparing a Si layer (**1**);
forming a first crystalline layer (**3***a*) of GaAs or GaAs-containing compound on said Si layer (**1**);
forming a Ge or Ge-containing crystalline layer (**4**) on said first crystalline layer (**3***a*); and



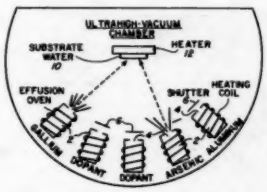
forming a second crystalline layer (**3***b*) of GaAs or GaAs-containing compound on said Ge or Ge-containing crystalline layer (**4**).

5,183,779

METHOD FOR DOPING GAAS WITH HIGH VAPOR PRESSURE ELEMENTS

Bijan Tadayon, and Saied Tadayon, both of Germantown, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1991, Ser. No. 695,018
Int. Cl.[5] H01L *21/223*
U.S. Cl. 437—165 **32 Claims**



1. A method of doping a relatively high vapor pressure element into semiconductor materials, said semiconductor materials deposited on a substrate using a molecular beam epitaxy chamber, the method comprising the steps of:
1) a first diffusion step of diffusing a first semiconductor material onto said substrate to form a first diffusion layer;
2) a second diffusion step, performed after completion of said first diffusion step, of diffusing a second semiconductor material onto said first diffusion layer to form a second diffusion layer;
3) a third diffusion step of diffusing said relatively high vapor pressure element onto at least one of said first and second layers; and
4) heating the substrate to no more than a relatively low temperature during at least said third diffusion step so as to permit said relatively high vapor pressure element to bond to crystal sites of the semiconductor material.

5,183,780

METHOD OF FABRICATING SEMICONDUCTOR DEVICE

Shigeru Noguchi; Satoshi Ishida; Hiroshi Iwata; Keiichi Sano, and Shoichiro Nakayama, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

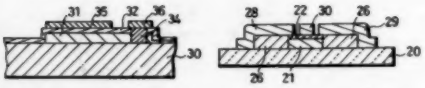
Filed Feb. 20, 1991, Ser. No. 658,389
Claims priority, application Japan, Feb. 22, 1990, 2-42135
Int. Cl.[5] H01L *21/26, 21/306*
U.S. Cl. 437—173 **34 Claims**

1. A method of fabricating a semiconductor device, comprising the steps of:
forming a semiconductor film on a substrate,

forming an insulator film so as to cover said semiconductor film;

providing a dopant source;

irradiating at least a region of said device with a high-energy



beam passing through said dopant source to melt both said insulator film and said semiconductor film in the irradiated region to form in said irradiated region a polycrystalline electrical contact region having dopant supplied from said dopant source.

5,183,781

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

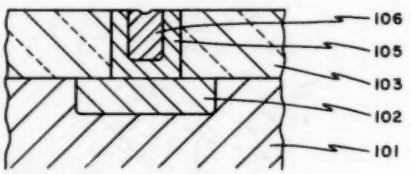
Eiichi Nakano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 8, 1991, Ser. No. 638,757

Claims priority, application Japan, Jan. 12, 1990, 2-5108

Int. Cl.[5] H01L *21/28, 21/88*

U.S. Cl. 437—191 **6 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

preparing a semiconductor substrate having a major surface with a diffusion layer formed at said major surface;

forming an interlayer insulating film on said major surface of said semiconductor substrate, said interlayer insulating film having an upper surface;

opening a contact hole in said interlayer insulating film, said opening extending from said upper surface of said interlayer insulating film to said major surface of said semiconductor substrate to expose a part of said diffusion layer, said contact hole having an inside wall surrounding said contact hole;

depositing a doped polycrystalline silicon film, while supplying phosphorus thereinto, said doped polycrystalline silicon film being deposited onto said upper surface of said interlayer insulating film, onto said inside wall of said contact hole, and onto said exposed part of said diffusion layer within said contact hole, the thickness of said doped polycrystalline silicon film being thin enough so that a said doped polycrystalline silicon film forms a concavity within and above said contact hole;

depositing a nondoped polycrystalline silicon film on said doped polycrystalline silicon film within and above said contact hole, said nondoped polycrystalline silicon film running over said concavity and over said doped polycrystalline silicon film above said upper surface of said interlayer insulating film;

etching away said nondoped polycrystalline silicon film by a reactive ion etching method with a sulfur hexafluoride gas, said etching continuing until it just exposes said doped polycrystalline silicon film above said upper surface of said interlayer insulation film and leaves said nondoped polycrystalline silicon film in only said concavity; and

further etching said doped polycrystalline silicon film and said nondoped polycrystalline silicon film simultaneously by a reactive ion etching method using a carbon fluoride gas, said further etching continuing until said upper surface of said interlayer insulating film is just exposed and the upper surface of said doped polycrystalline silicon film and said nondoped polycrystalline silicon film left in said contact hole is coplanar with said upper surface of said interlayer insulating film.

5,183,782

PROCESS FOR FABRICATING A SEMICONDUCTOR DEVICE INCLUDING A TUNGSTEN SILICIDE ADHESIVE LAYER

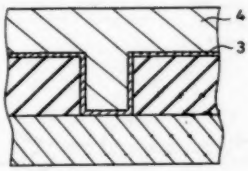
Shigeo Onishi; Tsutomu Yamadai, both of Nara, and Kazuya Ishihara, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1991, Ser. No. 794,146

Claims priority, application Japan, Jan. 26, 1991, 3-25601

Int. Cl.[5] H01L *21/283, 21/324*

U.S. Cl. 437—192 **9 Claims**



1. A process for fabricating a semiconductor device comprising the steps of:

depositing a tungsten silicide adhesive layer over a wafer having a SiO_2 insulating layer with a contact hole defined therein; then

treating said wafer by a rapid thermal annealing technique to impart further adherence to said tungsten silicide adhesive layer; and then

depositing tungsten over said tungsten silicide adhesive layer by CVD process to form a tungsten plug layer for electrical contact and a tungsten wiring layer.

5,183,783

METHOD FOR PRODUCTION OF DIELECTRIC-SEPARATION SUBSTRATE

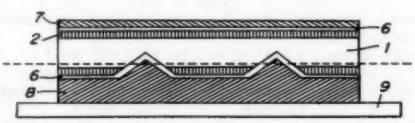
Yutaka Ohta; Konomu Ohki, and Masatake Katayama, all of Gunma, Japan, assignors to Shin-Etsu Handotai Co., Ltd, Japan

Filed Dec. 23, 1991, Ser. No. 811,958

Claims priority, application Japan, Dec. 28, 1990, 2-417208

Int. Cl.[5] H01L *21/302*

U.S. Cl. 437—225 **6 Claims**



1. A method for the production of a dielectric-separation substrate having a supporting member made of polycrystaline silicon, characterized by forming a thermal oxide film on a single crystal silicon substrate having grooves incised in advance therein, then forming a irreversibly thermally shrinkable

film on the rear surface of said single crystal silicon substrate prior to depositing polycrystalline silicon, subsequently depositing polycrystalline silicon on said single crystal silicon substrate, grinding the surface of the deposited polycrystalline silicon layer, and thereafter grinding said single crystal silicon substrate in conjunction with said irreversibly thermally shrinkable film.

5,183,784

SILVER-GLASS PASTES

My N. Nguyen, San Diego, Calif.; Chee-Kong Lee, Singapore, Singapore, and Thomas L. Herrington, Ramona, Calif., assignors to Johnson Matthey Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 482,489, Feb. 21, 1990, Pat. No. 5,075,262. This application Sep. 17, 1991, Ser. No. 760,454

Int. Cl.[5] C03C *8/18*

U.S. Cl. 501—19 **9 Claims**

1. In a silver-glass paste comprising silver flake, organic vehicle, organic resin, surfactant and a glass component, the improvement wherein the glass component comprises a mixture of lead phosphovanadate and lead telluride vanadate.

5,183,785

ALUMINUM BORATE CERAMICS AND PROCESS FOR PRODUCING SAME

Michael J. Readey, Denver, Colo., assignor to Coors Porcelain Company, Golden, Colo.

Filed Jun. 29, 1990, Ser. No. 545,864

Int. Cl.[5] C04B *35/10, 35/02, 35/18, 35/58*

U.S. Cl. 501—127 **11 Claims**

1. A process for producing an aluminum borate ceramic body comprising the steps of:

(a) calcining substantially dry boric acid-stabilized aluminum acetate powder at a temperature between about 800° C. and about 1600° C. in the presence of oxygen for a time sufficient to convert at least about 80% of the powder to aluminum borate;

(b) forming the calcined powder into a green body; and

(c) sintering the green body at a temperature between about 1300° C. and about 1800° C. for a time sufficient to form a sintered aluminum borate ceramic body having a porosity of at least about 40%.

5,183,786

DIELECTRIC MATERIAL, AND A CONDENSER MADE FROM THE SAME

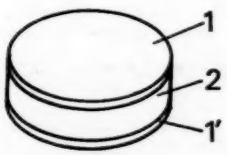
Seiji Gejima, Neyagawa; Koji Kawakita, Joyo; Suzushi Kimura; Hideyuki Okinaka, both of Toyonaka, and Yasuhiko Hakotani, Nishinomiya, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 18, 1991, Ser. No. 779,439

Claims priority, application Japan, Nov. 20, 1990, 2-317341

Int. Cl.[5] C04B *35/46*

U.S. Cl. 501—134 **7 Claims**



1. A dielectric material comprising a dielectric porcelain composition represented by the following general formula in the form of a pre-baked powder, and 1.0–25.0 mole % of lead oxide in which the amount of said lead oxide is converted into the amount of PbO:

$$(1-x)[Pb(Mg_{1/3}Nb_{2/3})Cu_aO_{3+a}]xBa(Ti_{1-b}Zr_b)O_3$$

wherein, x, a and b values satisfy $0.30<x<0.80$, $0 \leqq a \leqq 0.30$, and $0 \leqq b \leqq 0.15$.

5,183,787

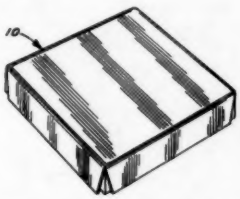
AMPHOTERIC CERAMIC MICROWAVE HEATING SUSCEPTOR COMPOSITIONS WITH METAL SALT MODERATORS

Jonathan Seaborne, Corcoran, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 270,179, Nov. 14, 1988, Pat. No. 4,965,427, which is a division of Ser. No. 94,972, Sep. 10, 1987, Pat. No. 4,808,780. This application Jul. 23, 1990, Ser. No. 557,853

Int. Cl.[5] C04B *33/24*

U.S. Cl. 501—143 **11 Claims**



1. A greenware composite composition useful as a susceptor for microwave heating with microwaves at about 2,450 MHz, comprising:

A. about 1% to 60% by weight of the composition of a binder selected from the group consisting of calcium sulphate, cements, calcite, dolomite, aragonite, silica fiber, whether amorphorus or crystalline, feldspar, pulverized polyamide fiber, colloidal silicas, fumed silicas, fiberglass, wood pulp, cotton fibers, thermoplastic resins and thermosetting resins;

B. about 15% to less than 99% by weight of the composition of an amphoteric ceramic susceptor material comprising a material which absorbs microwave energy and having a residual lattice charge; wherein the amphoteric ceramic susceptor material is selected from the group consisting of vermiculite, glauconite, Bentonite, zeolites, phologophite mica, biotite mica, Hectorite, Chlorite, Illite, Attapulgite, Saponite, Sepiolite, ferriginous smectite, kaolinites, Halloysites, and mixtures thereof, said amphoteric susceptor material being in a charged state by having been treated with an acid or base; and

C. about 0.5% to 6% by weight of the composition of a metal salt supplemental microwave absorbing material selected from the group consisting of sodium chloride, sodium sulfate, silver nitrate, silver citrate, sodium bicarbonate, potassium bicarbonate, magnesium sulfate, sodium citrate, potassium acetate, barium chloride, potassium iodide, potassium bromate, copper chloride, lithium chloride, ferric chloride and mixtures thereof, homogeneously dispersed through the composition; and

wherein the composition is unfired.

5,183,788

MODULAR SURFACE CATALYZED MEMBRANE CONTAINING A MICROPOROUS MEMBRANE CATALYST LAYER AND TRANSPORT LAYER

Allan J. Jacobson, Houston, Tex.; Wen-Yih F. Lai, Fair Lawn, N.J.; Michael G. Matturro, Lambertville, N.J.; Harry W. Deckman, Clinton, N.J.; James A. McHenry, Washington, N.J.; Robert P. Reynolds, Clinton, N.J., and Qiyao Zhang, Belvidere, N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 10, 1991, Ser. No. 775,646
Int. Cl.[5] B01J *35/04*
U.S. Cl. 502—4 10 Claims

1. A catalytic membrane comprising:

a porous substrate having a first surface and a second surface, the substrate having micropores at least in a region extending from the first surface to the second surface

a catalyst deposited on at least the first surface;

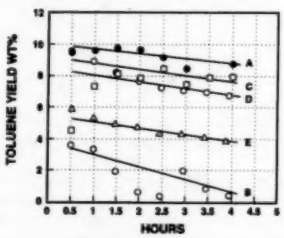
a substantially continuous transport layer on the first surface of the substrate and the catalyst deposited thereon wherein the transport layer consists essentially of a transition metal compound capable of transporting catalytically active species.

5,183,789

OZONE REGENERATION OF PLATINUM, AND POLYMETALLIC PLATINUM REFORMING CATALYSTS

Joseph P. Boyle, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 11, 1991, Ser. No. 667,120
Int. Cl.[5] B01J *23/96, 38/14;* C10G *35/09, 35/085*
U.S. Cl. 502—52 6 Claims



1. A process for the regeneration of a coked platinum-alumina, or polymetallic-platinum alumina reforming catalyst, which comprises contacting said catalyst with a gaseous stream of ozone in air, said stream containing from about 1 percent to about 50 percent ozone, based on the volume of the gas, at temperature ranging from about 60° C. to about 120° C. and at a space velocity of from about 50 to about 200 standard cubic feet per hour per pound of catalyst sufficient to burn and substantially deplete said catalyst of sufficient carbon to restore the activity of the catalyst to substantially that of the corresponding fresh catalyst.

5,183,790

USE OF ZSM-57 IN CATALYTIC CRACKING FOR GASOLINE OCTANE IMPROVEMENT AND CO-PRODUCTION OF LIGHT OLEFINS

Girish K. Chitnis, Chadds Ford, Pa.; Joseph A. Herbst, Turnersville, N.J., and Ernest W. Valyocsik, Yardley, Pa., assignors to Mobil Oil Corp., Fairfax, Va.

Division of Ser. No. 645,167, Jan. 24, 1991, Pat. No. 5,098,555.
This application Nov. 8, 1991, Ser. No. 790,621
Int. Cl.[5] B01J *502/67*
U.S. Cl. 502—67 16 Claims

1. A cracking catalyst composition comprising, as a first component, a large pore crystalline molecular sieve and, as a second component, ZSM-57.

9. A catalyst according to claim 1, wherein the first component is selected from the group consisting of Zeolite Omega, ZSM-20, mordenite, Zeolite Beta, Zeolite L, and mixtures thereof.

15. A catalyst according to claim 1, wherein said catalyst composition comprises, as a third component, a zeolite other than ZSM-57 which has a Constraint Index of 1 to 12.

5,183,791

CATALYSTS FOR THE METATHESIS OF OLEFINS AND FUNCTIONALIZED OLEFINS

Siegfried Warwel, Aachen; Hans-Gerd Jägers, Gladbeck, and Andreas Deckers, Ludwigshafen, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Division of Ser. No. 658,861, Feb. 22, 1991, Pat. No. 5,143,885.
This application Feb. 24, 1992, Ser. No. 840,197
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1990, 4006540
Int. Cl.[5] B01J *31/12, 23/36, 21/06;* C07C *6/00*
U.S. Cl. 502—102 8 Claims

1. A catalyst for the metathesis of olefins and functionalized olefins, which consists essentially of B_2O_3—Re_2O_7 on an Al_2O_3—SiO_2 substrate, wherein the B_2O_3—Re_2O_7 content is from 2 to 30% by weight, based on the Al_2O_3—SiO_2 content, and which catalyst further contains an organo-tin compound having the formula SnR_4, wherein R is an alkyl group of from 1 to 8 carbon atoms.

5,183,792

CATALYST FOR MAKING POLYETHYLENE

Li Wang, Bloomingdale, Ill., and Roy T. Mitsche, Peoria, Ariz., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 26, 1991, Ser. No. 798,214
Int. Cl.[5] B01J *21/06, 21/08, 23/26, 37/03*
U.S. Cl. 502—242 15 Claims

1. An olefin polymerization catalyst comprising chromium and titanium supported on silica prepared by the process comprising the steps of:

a) preparing an aqueous solution containing water soluble chromium and titanium compounds;

b) adding an ammonia-stabilized silica sol with an average silicate particle size of from about 2 to about 6 nm to solution of (a);

c) adding a sufficient amount of ammonium hydroxide to the solution of (b) to form a hydrogel;

d) aging, washing, and drying said hydrogel; and,

e) removing water from the pores of said hydrogel to form said catalyst.

5,183,793

AMMOXIDATION CATALYSTS AND METHODS FOR THEIR PREPARATION FOR USE IN THE PRODUCTION OF ISOPHTHALONITRILE

Christos Paparizos, Willownick, and Wilfrid G. Shaw, Lyndhurst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Nov. 13, 1991, Ser. No. 789,836
Int. Cl.[5] B01J *23/84*
U.S. Cl. 502—338 9 Claims

1. A method for producing a catalyst suitable for ammoxidation comprising the steps of:

a) forming an iron-antimony oxide composition including calcining and

b) combining said composition with vanadium and bismuth compounds and optionally other metal compounds to produce a catalyst containing the elements and proportions represented by the general formula:

$V_1Bi_aSb_bFe_cX_dY_eZ_fO_g$

wherein,
X=Mo, Cu, W, Nb, Te, P, Sn, Ge, As
Y=Co, Ni, Ce, La, Mn, Cr
Z=Alkali, alkaline earth, B, Tl and,
a=0.1–10, b=0.01–20, c=0.01–5, d=0–5, e=0–3, f=0–1, and g is determined by the valance requirements of the elements present.

5,183,794

METHOD FOR PREPARING A CATALYST FOR POLYMERIZATION OF OLEFINS

Hilkka Knuuttila, Porvoo, and Eeva-Liisa Lakomaa, Espoo, both of Finland, assignors to Neste Oy, Espoo, Finland

Filed Jan. 16, 1991, Ser. No. 641,907
Claims priority, application Finland, Jan. 16, 1990, 900256
Int. Cl.[5] B01J *21/06, 23/26*
U.S. Cl. 502—242 **18 Claims**

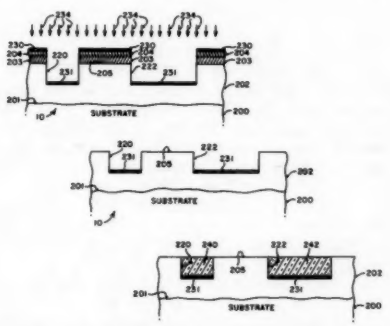
1. A method for preparing a polymerization catalyst for olefins, said catalyst containing catalytically active chromium and titanium compounds bound on an inorganic support, wherein said method comprises the steps of:
(a) vapourizing at least one precursor reagent of a catalytically active chromium or titanium compound;
(b) routing the obtained reagent vapour from step (a) into a reaction chamber where the vapour is brought to interact with an inorganic support material at about 160° to 500° C.;
(c) maintaining the vapour pressure of the reagent sufficiently high and the duration of interaction with the support sufficiently long so as to provide at least an equal amount or an excess amount of the reagent in relation to the available binding sites of the support material;
(d) removing the reagent not bound to the support material from the reaction chamber; and
(e) repeating the process step (a) through (d) at least once in order to bind at least another catalytically active compound to the support.

5,183,795

FULLY PLANAR METALIZATION PROCESS

Chiu H. Ting, Saratoga, and Pei-Lin Pai, Cupertino, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 660,922, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 450,180, Dec. 13, 1989, abandoned. This application Oct. 10, 1991, Ser. No. 774,372
Int. Cl.[5] H04L *21/02*
U.S. Cl. 437—230 **13 Claims**



1. A method for forming a planar interconnect level for VLSI devices comprising:
forming on a surface of a VLSI wafer a first dielectric layer having a planar top surface;
forming a masking layer on said first dielectric layer;
patterning said masking layer to define in said masking layer at least one location where an interconnect channel is to be formed;
etching said first dielectric layer at said location through said patterned masking layer to form an interconnect channel in said first dielectric layer;
implanting ions into the bottom surface of said interconnect channel, said ions forming a modified bottom surface of said interconnect channel to receive selective electroless metal deposition;
removing said patterned masking layer; and
depositing copper onto said modified bottom surface of said interconnect channel by selective electroless metal deposition, said deposition continuing until said interconnect channel is filled to a level substantially coincidence with the top surface of said first planar dielectric layer to thereby form a metal interconnect line, said metal interconnect line and said first dielectric layer forming a first planar interconnect level.

5,183,796

CATALYST FOR METATHETIC REACTIONS OF HYDROCARBONS AND METHOD FOR FORMING THE CATALYST

Pekka Knuuttila, Porvoo, and Eeva-Liisa Lakomaa, Espoo, both of Finland, assignors to Neste Oy, Espoo, Finland

Filed Jan. 16, 1991, Ser. No. 641,904
Claims priority, application Finland, Jan. 16, 1990, 900254
Int. Cl.[5] B01J *21/04, 23/02, 23/36*
U.S. Cl. 502—340 **20 Claims**

1. A heterogenic catalyst particularly suited for liquid- or vapour-phase metathetic reactions of hydrocarbons, said catalyst containing rhenium oxide bound onto an inorganic support material, wherein said catalyst is prepared by a method comprising the steps of:
vapourizing rhenium heptoxide precursor,
routing the rhenium heptoxide precursor vapour into a reaction chamber where the vapour is reacted with the support material at a temperature of about 160° to 500° C.,
maintaining the vapour pressure of the rhenium heptoxide precursor sufficiently high and the duration of the interaction with the support material sufficiently long so as to provide at least an equal amount of or an excess of the rhenium heptoxide precursor in relation to the available binding sites of the support material, and
removing the rhenium heptoxide precursor not bound to the support material from the reaction chamber to form said heterogenic rhenium oxide containing catalyst.

5,183,797

CATALYST FOR HYDROHALOGENATION OF HYDROCARBONS

Michael T. Holbrook; Lawrence A. Hebert, both of Baton Rouge, La.; Stephen W. Najmy, Midland, Mich.; Ernest F. Stine, Jr., Knoxville, Tenn., and Reimer Hasche, Hammah, Fed. Rep. of Germany, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 699,530, May 14, 1991, Pat. No. 5,109,138, which is a continuation-in-part of Ser. No. 529,009, May 24, 1990, abandoned. This application Nov. 7, 1991, Ser. No. 789,217
Int. Cl.[5] B01J *21/04*
U.S. Cl. 502—355 **5 Claims**

1. A hydrohalogenation catalyst having reduced coking, decreased pressure drop over the catalyst lifetime, and increased catalyst life in a hydrohalogenation reactor charge for the reaction of methanol and a hydrogen halide gas mixture, said catalyst comprising at least two zones wherein the catalytic activity for hydrohalogenation of each zone is lower than that of each succeeding zone.

5,183,798

MULTIPLE PASS LASER PRINTING FOR IMPROVED UNIFORMITY OF A TRANSFERRED IMAGE

Sanwal P. Sarraf; Sharon W. Weber, both of Webster; Hugh S. A. Gilmour, Rochester, and Linda I. Ficcaglia, Geneva, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 16, 1991, Ser. No. 730,739
Int. Cl.[5] B41M *5/035, 5/38*
U.S. Cl. 503—227 7 Claims

1. In a process of forming a laser-induced thermal dye transfer image comprising:

a) contacting at least one dye-donor element comprising a support having thereon a dye layer, having an infrared-absorbing material associated therewith, with a dye-receiving element comprising a support having thereon a polymeric dye image-receiving layer, said dye-donor and dye-receiver being separated by spacer beads;

b) imagewise-heating said dye-donor element by means of a laser at a given power supplied to the laser; and

c) transferring a dye image to said dye-receiving element to form said laser-induced thermal dye transfer image,

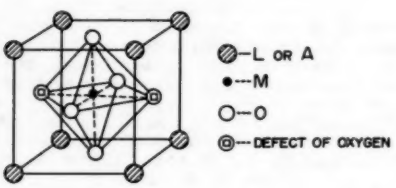
the improvement wherein another portion of said dye-donor element or another dye-donor element is imagewise-heated by said laser to transfer a second dye image which is approximately the same hue as said first dye image and is in register with said first dye image to produce a given density, the power supplied to said laser for said first and second imagewise heatings being lower than the power which would have to be supplied to said laser to produce the same given density with only one imagewise heating.

5,183,799

SUPERCONDUCTING MATERIALS INCLUDING LA-SR-NB-O, Y-BA-NB-O, LA-SR-NB-CU-O, AND Y-BA-NB-CU-O

Tetsuya Ogushi; Yoshinori Hakuraku, both of Kagoshima, and Hisanao Ogata, Ibraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 423,200, Oct. 18, 1989, abandoned, which is a division of Ser. No. 181,097, Apr. 13, 1988, Pat. No. 4,892,862. This application Jul. 10, 1991, Ser. No. 727,310
Claims priority, application Japan, Apr. 13, 1987, 62-88847; May 18, 1987, 62-118844; May 18, 1987, 62-118846; Aug. 21, 1987, 62-206359; Aug. 21, 1987, 62-206360
Int. Cl.[5] C01F *11/02, 17/00;* C01G *33/00;* H01L *39/12*
U.S. Cl. 505—1 5 Claims



2. A superconducting material which is represented by the formula:

$$(La_xSr_{1-x})_iNbO_y$$

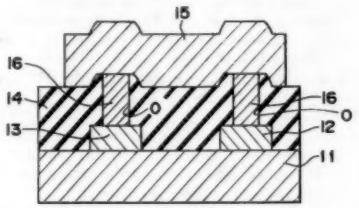
wherein x is $0<x<1$; i is 1, 3/2 or 2 and y is $0<y\leqq 3$ in the case of $i=1$ or $0<y\leqq 4$ in the case of $i=3/2$ or 2.

5,183,800

INTERCONNECTION METHOD FOR SEMICONDUCTOR DEVICE COMPRISING A HIGH-TEMPERATURE SUPERCONDUCTIVE MATERIAL

Yasuhito Nakagawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 192,671, May 10, 1988, abandoned.
This application Jun. 7, 1991, Ser. No. 711,716
Claims priority, application Japan, Jul. 15, 1987, 62-176220
Int. Cl.[5] H01L *21/28, 21/324*
U.S. Cl. 505—1 8 Claims



1. An interconnection method for a semiconductor device comprising the steps of:

depositing an interlevel insulation layer of predetermined thickness over a semiconductor substrate formed with a first level metal on a surface and active elements in a lower semiconductor layer;

forming through-holes through the interlevel insulation layer for connecting the first level metal with a second level interconnection;

depositing a metallic material within the through-holes;

depositing a high-temperature superconductive material over the surface of the interlevel insulation layer and the metallic material;

heat-treating the surface of the high-temperature superconductive material thus deposited over the interlevel insulation layer by laser annealing for imparting thereto superconductive characteristics and simultaneous alignment of crystal orientation; and

removing unnecessary portions of the high-temperature superconductive material by etching,

said step of depositing an interlevel insulation layer protecting the active elements from thermal damage caused by said step of heat treating by laser annealing.

5,183,801

STABILIZED BISMUTH OXIDE

Anil V. Virkar, and Kuan-Zong Fung, both of Salt Lake City, Utah, assignors to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 342,291, Apr. 24, 1989, Pat. No. 5,006,494. This application Apr. 9, 1991, Ser. No. 682,748
The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.
Int. Cl.[5] C04B *35/48, 35/50*
U.S. Cl. 501—152 5 Claims

1. A stable bismuth oxide ceramic composition consisting essentially of:

bismuth oxide substantially present in a high temperature phase as the predominant component;

a rare earth oxide present in a quantity of about 10 mole percent to about 40 mole percent; and

an oxide compound having a cationic element having a valence of four or more present in minor quantities of about 0.1 mole percent to about 10 mole percent.

5,183,802

PHARMACEUTICAL COMPOSITIONS FOR INTRANASAL ADMINISTRATION OF CALCITONIN

Valerio Aliverti, Castellanza; Luciano Dorigotti, Basiglio; Teodoro Fonio, Arese, and Mario Pinza, Corsico, all of Italy, assignors to ISF Societa per Azioni, Italy

Filed Nov. 14, 1988, Ser. No. 270,905

Claims priority, application Italy, Nov. 13, 1987, 22647 A/87; Feb. 25, 1988, 19541 A/88

Int. Cl.[5] A61K *37/30*

U.S. Cl. 514—2 22 Claims

1. A pharmaceutical composition comprising a non-toxic, therapeutically effective amount of a calcitonin, a non-toxic effective amount of an absorption enhancer which is a glycyrrhizinate, and a pharmaceutically acceptable carrier.

5,183,803

Patent Not Issued For This Number

5,183,804

POLYPEPTIDE COMPRISING REPEATED CELL-ADHESIVE CORE SEQUENCES

Ikuo Saiki; Norio Nishi; Ichiro Azuma, and Seiichi Tokura, all of Hokkaido, Japan, assignors to Ichiro Azuma, Hokkaido, Japan

Filed Jun. 23, 1989, Ser. No. 370,182

Claims priority, application Japan, Jun. 24, 1988, 63-156133

Int. Cl.[5] C07K *7/06, 7/08, 7/10;* A61K *37/02*

U.S. Cl. 514—12 3 Claims

1. A polypeptide of the following formula:

$$(Arg\text{-}Gly\text{-}Asp)_n$$

wherein n is a number from 2 to 20 or a pharmaceutically acceptable salt thereof.

5,183,805

BIOACTIVE EGF PEPTIDES FOR PROMOTION OF TISSUE REGENERATION AND CANCER THERAPY

Jin S. Lee, and Mark Blick, both of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Aug. 13, 1990, Ser. No. 567,407

Int. Cl.[5] A61K *37/00, 37/02;* C07K *5/00, 7/00*

U.S. Cl. 514—13 16 Claims

1. A biologically active peptide fragment of EGF peptide consisting essentially of NCVVGYIGERCQYRDLK having a carboxyl end amide group and an amino end acetyl.

5,183,806

Patent Not Issued For This Number

5,183,807

USE OF MONOSIALOGANGLIOSIDE GM, TO PREVENT THE DEVELOPMENT OF TOLERANCE TO THE ANALGESIC EFFECT OF MORPHINE AND RELATED DRUGS

Francesco della Valle, Padua, and Gino Toffano, Montegrotto Terme, both of Italy, assignors to FIDIA S.p.A., Abano Terme, Italy

Filed Jun. 28, 1991, Ser. No. 723,280

Claims priority, application Italy, Jun. 29, 1990, 20822 A/90

Int. Cl.[5] A61K *31/70, 31/715, 31/44*

U.S. Cl. 514—25 8 Claims

1. A method for preventing the development of tolerance to the analgesic effect of morphine, of chemically correlated opiates and of methadone and its derivatives, which comprises administering to patients in need thereof, either prior to, contemporaneously with or successively to the analgesic administration of said compounds, a therapeutically effective amount of the ganglicside GM_1, its pharmacologically acceptable salts or its internal ester derivative, alone or together in mutual association.

5,183,808

METHOD FOR TREATING FUNGAL INFECTIONS WITH SERINE ANALOGS OF BU-3608 ANTIBIOTICS

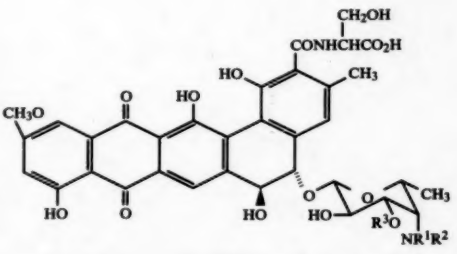
Yosuke Sawada, Tokyo; Masatoshi Kakushima, Yokohama; Maki Nishio, Tokyo; Takeo Miyaki, and Toshikazu Oki, both of Yokohama, all of Japan, assignors to Bristol-Myers Squibb Company, New York, N.Y.

Division of Ser. No. 699,548, May 14, 1991, Pat. No. 5,114,857, which is a division of Ser. No. 569,679, Aug. 20, 1990, Pat. No. 5,061,624, which is a division of Ser. No. 269,821, Nov. 10, 1988, Pat. No. 4,973,673. This application Feb. 19, 1992, Ser. No. 837,718

Int. Cl.[5] A61K *31/71*

U.S. Cl. 514—33 1 Claim

1. A method for treating fungal infections in a mamalian host which comprises administering to said host an antifungally effective amount of a compound having the formula



wherein the serine is D-serine; R^1 and R^2 are independently H or C_{1-16} alkyl; and R^3 is H or β-D-xylosyl; or a pharmaceutically acceptable salt thereof.

5,183,809

CYCLODEXTRIN POLYMERS AND CYCLODEXTRINS IMMOBILIZED ON A SOLID SURFACE

Paul B. Weisz, Yardley, Pa.; Yuen W. Shing, Randolph, and Judah Folkman, Brookline, both of Mass., assignors to The Trustees of the University of Pennsylvania/Childrens Hospital Corporation, Philadelphia, Pa.

Filed Feb. 15, 1990, Ser. No. 480,407

Int. Cl.[5] C08B *37/16*; C07H *1/00*; A61K *31/56*

U.S. Cl. 514—58 **24 Claims**

1. A polyionic derivative of an alpha-, beta-, or gamma-cyclodextrin polymer in which the ionic group is sulfate, phosphate, carboxylate, or nitrate.

5,183,810

IMIDAZOLE ANGIOTENSIN II ANTAGONISTS INCORPORATING A SUBSTITUTED BENZYL ELEMENT

William J. Greenlee, Teaneck; Arthur A. Patchett, Westfield, both of N.J.; David Hangauer, East Amherst, N.Y.; Thomas F. Walsh, Westfield, N.J.; Kenneth J. Fitch, Cranford, N.J.; Ralph A. Rivero, Eatontown, N.J., and Daljit S. Dhanoa, Tinton Falls, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

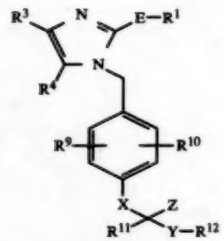
Continuation of Ser. No. 671,593, Mar. 19, 1991, abandoned, which is a continuation of Ser. No. 479,780, Feb. 13, 1990, abandoned. This application Aug. 13, 1991, Ser. No. 744,565

Int. Cl.[5] A61K *31/415*; C07D *403/04, 403/06, 403/10*

U.S. Cl. 514—63 **8 Claims**

1. A compound of Formula 1 which is

FORMULA I



or a pharmaceutically acceptable salt thereof wherein:

R^1 is:

(a) $(C_1–C_6)$-alkyl, $(C_2–C_6)$-alkenyl or $(C_2–C_6)$-alkynyl each of which is unsubstituted or substituted with a substituent selected from the group consisting of:
i) aryl as defined below,
ii) $(C_3–C_7)$-cycloalkyl,
iii) Cl, Br, I, F,
iv) $COOR^2$,
vii) $N[((C_1–C_4)\text{-alkyl})]_2$,
viii) $NHSO_2R^2$,
ix) CF_3,
x) $COOR^2$, or
xi) SO_2NHR^{2a}; and

(b) aryl, wherein aryl is defined as phenyl or naphthyl, unsubstituted or substituted with 1 or 2 substituents selected from the group consisting of:
i) Cl, Br, F, I,
ii) $(C_1–C_4)$-alkyl,
iii) $(C_1–C_4)$-alkoxy,
iv) NO_2
v) CF_3
vi) $SO_2NR^{2a}R^{2a}$,
vii) $(C_1–C_4)$-alkylthio,
viii) hydroxy,
ix) amino,
x) $(C_3–C_7)$-cycloalkyl,
xi) $(C_3–C_{10})$-alkenyl; and

E is:
(a) a single bond,
(b) $—S(O)_x(CH_2)_s—$, or
(c) —O—; and

x is 0 to 2,

s is 0 to 5;

m is 1 to 5;

p is 0 to 3;

n is 1 to 10;

R^2 is:
(a) H, or
(b) $(C_1–C_6)$-alkyl, and

R^{2a} is:
(a) R^2,
(b) CH_2-aryl, or
(c) aryl; and

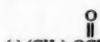
R^3 is:
(a) H,
(b) $(C_1–C_6)$-alkyl, $(C_2–C_6)$-alkenyl or $(C_2–C_6)$-alkynyl,
(c) Cl, Br, I, F,
(d) NO_2
(e) $(C_1–C_8)$-perfluoroalkyl,
(f) C_6F_5,
(g) CN,
(h) NH_2,
(i) $NH[(C_1–C_4)\text{-alkyl}]$,
(j) $N[(C_1–C_4)\text{-alkyl}]_2$,
(k) $NH[CO(C_1–C_4)\text{-alkyl}]$,
(l) $N[(C_1–C_4)\text{-alkyl})\text{-}(CO(C_1–C_4)\text{-alkyl})]$,
(m) $N(C_1–C_4)\text{-alkyl-COaryl}$,
(n) $N(C_1–C_4)\text{alkyl-}SO_2\text{aryl}$,
(o) CO_2H,
(p) CO_2R^{2a},
(q) phenyl,
(r) phenyl-$(C_1–C_3)$-alkyl,
(s) phenyl and phenyl-$(C_1–C_3)$-alkyl substituted on the phenyl ring with one or two substituents selected from:
i) $(C_1–C_4)$-alkyl,
ii) $(C_1–C_4)$-alkoxyl,
iii) F, Cl, Br, I,
iv) hydroxyl,
v) methoxyl,
vi) CF_3,
vii) CO_2R^{2a}, or
viii) NO_2; and

R^4 is:
(a) H,
(b) CN,
(c) $(C_1–C_8)$-alkyl,
(d) $(C_2–C_6)$-alkenyl,
(e) $(C_1–C_8)$-perfluoroalkyl,
(f) $(C_1–C_8)$-perfluoroalkenyl,
(g) NH_2,
(h) $NH(C_1–C_4)$-alkyl,

(i) $N[(C_1–C_4)\text{-alkyl}]_2$,
(j) $NH(C_1–C_4)\text{-acyl}$,
(k) $N[((C_1–C_4)\text{-acyl})((C_1–C_4)\text{-alkyl})]$,
(l) CO_2H,
(m) CO_2R^{24},
(n) phenyl,
(o) phenyl-$(C_2–C_6)$-alkenyl,

(p)

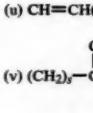
(q)


(r)

(s)

(t)

(u)

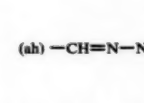

(v)

(w)

(x)

(y)

(z) $(CH_2)_nNHSO_2R^{16}$,
(aa) $(CH_2)_nF$,
(ab) $(CH_2)_m$-imidazol-1-yl,
(ac) tetrazol-5-yl,
(ad) —CONH—SO_2-aryl,
(ae) —CONH—SO_2-$(C_1–C_8)$-alkyl, wherein the alkyl group is unsubstituted or substituted with a substituent selected from the group consisting of: —OH, —SH, —O$(C_1–C_4)$-alkyl, —S—$(C_1–C_4)$-alkyl, $—CF_3$, Cl, Br, F, I, $—NO_2$, $—CO_2H$, $—CO_2—(C_1–C_4)$-alkyl, $—NH_2$, $—NH[(C_1–C_4)\text{-alkyl}]$, $—N[(C_1–C_4)\text{-alkyl}]_2$; and
(af) —CONH—SO_2—$(C_1–C_4)$-perfluoroalkyl,
(ag) $—CONHSO_2NR^{2a}R^{2a}$; and

(ah)  ; and

R^5 is:
(a) CN,
(b) NO_2, or
(c) CO_2R^{2a}; and
R^9 and R^{10} are independently:
(a) H,
(b) $(C_1–C_6)$-alkyl, unsubstituted or substituted with $(C_3–C_7)$-cycloalkyl,
(c) $(C_2–C_6)$-alkenyl,
(d) $(C_2–C_6)$-alkynyl,
(e) Cl, Br, F, I,
(f) $(C_1–C_6)$-alkoxy,
(g) when R^9 and R^{10} are on adjacent carbons, they can be joined to form an phenyl ring,
(h) $(C_1–C_6)$-perfluoroalkyl,
(i) $(C_3–C_7)$-cycloalkyl, unsubstituted or substituted with $(C_1–C_6)$-alkyl,
(j) aryl,
(k) $(C_1–C_6)\text{-alkyl-S(O)}_x—(CH_2)_n—$,
(l) hydroxy-$(C_1–C_6)$-alkyl,
(m) $—CF_3$,
(n) $—CO_2R^{2a}$,
(o) —OH,
(p) $—NR^2R^{21}$,
(q) $—[(C_1–C_6)\text{-alkyl}]NR^2R^{21}$,
(r) $—NO_2$,
(s) $—(CH_2)_n—SO_2—N(R^2)_2$,
(t) $—NR^2CO—(C_1–C_4)$-alkyl, or
(u) $—CON(R^2)_2$; and
X is:
(a) —O—,
(b) $—S(O)_x—$,
(c) $—NR^{13}—$
(d) $—CH_2O—$,
(e) $—CH_2S(O)_x$,
(f) $—CH_2NR^{13}—$,
(g) $—OCH_2—$,
(h) $—NR^{13}CH_2—$,
(i) $—S(O)_xCH_2—$,
(j) $—CH_2—$,
(k) $—(CH_2)_2—$,
(l) single bond, or
(m) —CH═, wherein Y and R^{12} are absent forming a —C═C— bridge to the carbon bearing Z and R^{11}; and
Y is:
(a) single bond,
(b) —O—,
(c) $—S(O)_x—$,
(d) $—NR^{13}—$, or
(e) $—CH_2—$; and
except that X and Y are not defined in such a way that the carbon atom to which Z is attached also simultaneously is bonded to two heteroatoms (O, N, S, SO, SO_2);
R^{11} and R^{12} are independently:
(a) H,
(b) $(C_1–C_6)$-alkyl, unsubstituted or substituted with a substituent selected from the group consisting of:
(i) aryl,
(ii) $(C_3–C_7)$-cycloalkyl,
(iii) NR^2R^{21},
(iv) OH,
(v) CO_2R^{2a}, or
(vi) $CON(R^2)_2$,
(c) aryl or aryl-$(C_1–C_2)$-alkyl, unsubstituted or substituted with 1 to 3 substitutents selected from the group consisting of:
(i) Cl, Br, I, F,
(ii) $(C_1–C_6)$-alkyl,
(iii) $[(C_1–C_5)\text{-alkenyl}]CH_2—$,
(iv) $[(C_1–C_5)\text{-alkynyl}]CH_2—$,
(v) $(C_1–C_6)\text{-alkyl-S(O)}_x—(CH_2)_x—$,
(vi) $—CF_3$,
(vii) $—CO_2R^{2a}$,
(viii) —OH,
(ix) $—NR^2R^{21}$,
(x) $—NO_2$,
(xi) $—NR^2COR^2$,
(xii) $—CON(R^2)_2$,
(xiii) $—G—[(C_1–C_6)\text{-alkyl}]—R^{23}$,
(xiv) $—P(O)[O—(C_1–C_4)\text{-alkyl}]_2$,
and can additionally be substituted with 1 or 2 substituents selected from the group consisting of: Br, Cl or F,
(d) $(C_3–C_7)$-cycloalkyl;

G is: a single bond, O, $S(O)_x$ or NR^{23}; and

R^{13} is:

(a) H,

(b) $(C_1–C_6)$-alkyl,

(c) aryl,

(d) aryl-$(C_1–C_6)$-alkyl—(C=O)—,

(e) $(C_1–C_6)$-alkyl—(C=O)—,

(f) $[(C_2–C_5)$-alkenyl$]CH_2$—,

(g) $[(C_2–C_5)$-alkynyl$]CH_2$—, or

(h) aryl-CH_2—; and

Z is:

(a) $—CO_2H$,

(b) $—CO_2R^{24}$,

(c) —tetrazol-5-yl,

(d) —CO—NH(tetrazol-5-yl)

(e) —CONH—SO_2-aryl,

(f) —CONH—SO_2—$(C_1–C_8)$-alkyl, wherein the alkyl group is unsubstituted or substituted with a substituent selected from the group consisting of: —OH, —SH, —O$(C_1–C_4)$-alkyl, —S—$(C_1–C_4)$-alkyl, $—CF_3$, Cl, Br, F, I, $—NO_2$, $—CO_2H$, $—CO_2$—$(C_1–C_4)$-alkyl, $—NH_2$, —NH$[(C_1–C_4)$-alkyl], —N$[(C_1–C_4)$-alkyl$]_2$; and

(g) —CONHSO$_2$—$(C_1–C_4)$-perfluoroalkyl,

(i) $—CONHSO_2NR^{2a}R^{2a}$; and

(j) $—SO_2NHCO$-aryl,

(k) $—SO_2NHCO$—$(C_1–C_8)$-alkyl, wherein the alkyl group is unsubstituted or substituted with a substituent selected from the group consisting of: —OH, —SH, —O$(C_1–C_4)$-alkyl, —S—$(C_1–C_4)$-alkyl, $—CF_3$, Cl, Br, F, I, $—NO_2$, $—CO_2H$, $—CO_2$—$(C_1–C_4)$-alkyl, $—NH_2$, —NH$[(C_1–C_4)$-alkyl], —N$[(C_1–C_4)$-alkyl$]_2$; and

(l) $—SO_2NHCO$—$(C_1–C_4)$-perfluoroalkyl,

(n) $—SO_2NHCONR^{2a}R^{2a}$;

(o) $—PO(OH)_2$,

(p) $—PO(OR^2)_2$, or

(q) $—PO(OH)(OR^2)$; and

R^{14} is:

(a) H,

(b) $(C_1–C_8)$-alkyl,

(c) $(C_1–C_8)$-perfluoroalkyl,

(d) $(C_3–C_6)$-cycloalkyl,

(e) phenyl, or

(f) benzyl; and

R^{15} is:

(a) H,

(b) $(C_1–C_6)$-alkyl,

(c) $(C_3–C_6)$-cycloalkyl,

(d) $(CH_2)_p$-phenyl,

(e) OR^{17},

(f) $NR^{18}R^{19}$; and

R^{16} is:

(a) $(C_1–C_8)$-alkyl,

(b) $(C_1–C_8)$-perfluoroalkyl,

(c) 1-adamantyl,

(d) 1-naphthyl,

(e) (1-naphthyl)ethyl, or

(f) $—(CH_2)_p$-phenyl; and

R^{17} is:

(a) H,

(b) $(C_1–C_6)$-alkyl,

(c) $(C_3–C_6)$-cycloalkyl,

(d) phenyl, or

(e) benzyl; and

R^{18} and R^{19} are independently:

(a) H,

(b) $(C_1–C_4)$-alkyl,

(c) phenyl,

(d) benzyl, or

(e) α-methylbenzyl; and

R^{21} is:

(a) H, or

(b) $(C_1–C_4)$-alkyl, is unsubstituted or substituted with:

i) NH_2,

ii) NH$[(C_1–C_4)$-alkyl],

iii) N$[(C_1–C_4)$-alkyl$]_2$,

iv) CO_2H,

v) $CO_2(C_1–C_4)$-alkyl,

vi) OH,

vii) SO_3H, or

viii) SO_2NH_2; and

R^{22} is:

(a) H,

(b) $(C_1–C_4)$-alkyl,

(c) $(C_1–C_4)$-alkoxyl,

(d) aryl,

(e) aryl-$(C_1–C_4)$-alkyl,

(f) CO_2R^{2a},

(g) $CON(R^2)_2$,

(h) SO_2R^{2a},

(i) $SO_2N(R^2)_2$,

(j) P(O)$[(C_1–C_4)$-alkoxyl$]_2$, or

(k) imidazol-2-yl or imidazol-4-yl, in which the imidazole can be substituted with $(C_1–C_4)$-alkyl; and

R^{23} is:

(a) OH,

(b) NR^2R^{21},

(c) CO_2R^{2a},

(d) $CON(R^2)_2$,

(e) $S(O)_x$—$(C_1–C_4)$-alkyl,

R^{24} is:

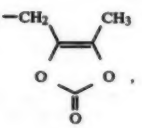
(a) $(C_1–C_4)$-alkyl,

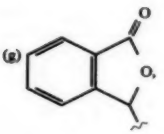
(b) $CHR^{25}—O—COR^{26}$,

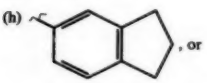
(c) $CH_2CH_2—N[(C_1–C_2)$-alkyl$]_2$,

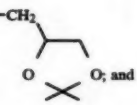
(d) $(CH_2CH_2O)_y$—O—$[(C_1–C_4)$-alkyl], wherein y is 1 or 2,

(e) aryl, or —CH_2-aryl, where aryl is as defined above or optionally substituted with —CO_2—$(C_1–C_4)$-alkyl,

(f) 

(g) 

(h) 

(i) 

R^{25} and R^{26} independently are $(C_1–C_6)$-alkyl or phenyl.

5,183,811

GLYCEROL DERIVATIVE AND ANTI-HYPERTENSIVE AGENT

Mitsuo Masaki, Chiba; Hiromitsu Takeda, Washimiya; Toshiro Kamishiro, and Masao Yamamoto, both of Misato, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

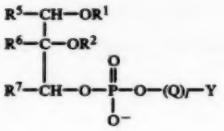
Division of Ser. No. 172,581, Mar. 24, 1988, Pat. No. 4,962,096. This application Jul. 19, 1990, Ser. No. 554,343

Claims priority, application Japan, Mar. 24, 1987, 62-69943; Mar. 24, 1987, 62-69944; Mar. 31, 1987, 62-80705; Mar. 31, 1987, 62-80706

Int. Cl.[5] C07F *9/58, 9/60, 9/6533, 9/62;* A61K *31/675*

U.S. Cl. 514—79 6 Claims

1. A glycerol derivative having the formula:



wherein

R^1 is a straight or branched chain alkyl group having 10–22 carbon atoms:

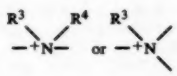
R^2 is a straight or branched chain acyl group having 1–6 carbon atoms or benzoyl;

R^5, R^6 and R^7 are independently hydrogen or a straight or branched chain alkyl group having 1–6 carbon atoms;

Q_l is a saturated or unsaturated alkylene divalent bridging radical having 1–4 carbon atoms optionally substituted by one or two methyl or phenyl groups.

l is 1; and

Y represents a heterocyclic group selected from the group consisting of 2-or-3-pyrrolidinyl, 2-3-or-4-piperdinyl, 2-morpholinyl, 2-or-3-perhydroazepinyl, 5-oxazolyl, 2-(1,2,3,4-tetrahydroquinolinyl), 2-or-3-(1,2,3,4-tetrahydroisoquinolinyl, 3-isoquinolinyl, 3-(1,2,5,6,-tetrahydropyridyl), and 3-pyridyl, which has a moiety represented by



wherein R^3 and R^4 are independently a straight or branched chain alkyl group having 1–6 atoms, and said heterocyclic group optionally has one or two substituents selected from the group consisting of a straight or branched chain alkyl group having 1–6 carbon atoms or phenyl, or a pharmaceutically acceptable salt thereof.

5,183,812

PREPARATION AND USE OF THIOPHOSPHONATES AND THIO-ANALOGUES OF PHOSPHONOFORMIC ACID

Charles E. McKenna, 16625 Pequeno Pl., Pacific Palisades, Calif. 90272

Division of Ser. No. 369,468, Jun. 21, 1989, Pat. No. 5,072,032. This application Sep. 30, 1991, Ser. No. 768,155

Int. Cl.[5] A61K *31/66;* C07F *9/38, 9/40*

U.S. Cl. 514—120 7 Claims

1. A method for the conversion of trimethyl phosphonoformate into trimethyl thionophosphonoformate, said method comprising the steps of:

forming a reaction mixture of trimethyl phosphonoformate, an effective amount of Lawesson's reagent and polar, aprotic solvent; and

heating said reaction mixture until conversion is substantially complete.

6. A method of treating a human infected with the human immunodeficiency virus (HIV) to inhibit HIV activity comprising the administration of a pharmaceutically effective amount of thiophosphonoformic acid (TPFA) or a pharmaceutically acceptable salt thereof.

5,183,813

ANTIARRHYTHMIC AGENTS

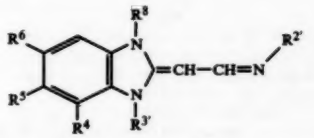
Kenneth C. Mattes, Rochester, and Bhaskar R. Venepalli, Fairport, both of N.Y., assignors to Sterling Winthrop Inc., New York, N.Y.

Filed Feb. 19, 1992, Ser. No. 838,391

Int. Cl.[5] A61K *31/52, 31/415*

U.S. Cl. 514—150 1 Claim

1. A method of treating arrythmias or inhibiting ventricular tachycardias in a mammalian subject in need thereof comprising administering to said subject an effective amount of a compound having the formula:



wherein $R^{2'}$ is t-butyl or phenyl;

$R^{3'}$ is ethyl or 2,2,2,-trifluoroethyl;

R^4, R^5 and R^6 are independently H, alkyl, aryl, alkylsulfonamido, arylsulfonamido, alkoxy, aryloxy, alkylthio, arylazo, alkenyl, cyano, halo, nitro, alkyl-CO-O-, alkyl-O-CO-, aryl-CO-O-, aryl-O-CO-, alkylcarbonylimino, alkyliminocarbonyl, arylcarbonylimino, aryliminocarbonyl, alkyl-CO-or aryl-CO-, or R^4 and R^5, or R^5 and R^6, or R^4, R^5 and R^6 taken together represent the atoms necessary to complete a fused carbocyclic ring group containing from 1 to 3 rings; and

R^8 is alkyl, or aryl.

5,183,814

SELECTIVE OESTROGEN THERAPY FOR PERIMENOPAUSAL OR POSTMENOPAUSAL CONDITIONS

Michael Dukes, Wilmslow, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Filed Jun. 6, 1989, Ser. No. 362,043

Claims priority, application United Kingdom, Jun. 6, 1988, 8813353

Int. Cl.[5] A61K *31/56, 31/165, 31/10*

U.S. Cl. 514—171 4 Claims

1. A method of selective oestrogen therapy of perimenopausal or postmenopausal conditions which comprises administering to a warm-blooded animal an oestrogen and a pure antioestrogen, the oestrogen and pure antioestrogen being present in amounts such that the oestrogen is effective only in selected oestrogen-responsive tissues and is selectively opposed in other oestrogen-responsive tissues.

5,183,815

NOVEL BONE ACTING AGENTS

Walfred S. Saari, Lansdale; Gideon A. Rodan, Bryn Mawr; Thorsten E. Fisher, and Paul S. Anderson, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 644,178, Jan. 22, 1991, abandoned. This application Feb. 19, 1992, Ser. No. 839,741

Int. Cl.[5] A61K *31/56, 31/58*

U.S. Cl. 514—172 15 Claims

1. A compound of the formula:

A-B-C

wherein:

A is a residue of a hydroxyl containing steroidal hormone possessing human bone resorption antagonist activity or bone formation stimulatory activity;

C is a residue of an amino or hydroxy alkyl-1,1-bisphosphonate, possessing human bone affinity; and

B is a covalent linkage selected from the group consisting of carbamate, carbonate, thiocarbamate, and thiocarbonate, connecting A through the hydroxyl moiety to C through the respective amino or hydroxyl moiety, which linkage can hydrolyze in the human body in the vicinity of bone to release steroidal hormone A, and pharmaceutically acceptable salts or esters thereof.

5,183,816

BICYCLIC SULFUR-CONTAINING COMPOUNDS

Takakazu Morita, Toyonaka; Shiro Mita, Ashiya, and Yoichi Kawashima, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

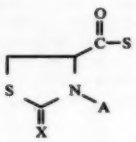
Filed Jun. 20, 1991, Ser. No. 718,220

Claims priority, application Japan, Jul. 3, 1990, 2-175782

Int. Cl.[5] A61K *31/54;* **C07D** *513/04*

U.S. Cl. 514—224.2 **12 Claims**

1. A compound of the formula (I) and pharmaceutically acceptable salts thereof,



(I)

wherein

X is oxygen or sulfur; and

A is a straight C_2 alkylene group which is unsubstituted or substituted by one or more C_1–C_6 alkyl groups.

5,183,817

COMBINATIONS OF RETINOIDS AND MINOXIDIL-TYPE COMPOUNDS FOR HAIR GROWTH

Gail S. Bazzano, 4506 Avron Blvd., Metairie, La. 70006

Continuation-in-part of Ser. No. 136,525, Dec. 22, 1987, abandoned, which is a continuation of Ser. No. 463,146, Feb. 2, 1983, abandoned, which is a continuation-in-part of Ser. No. 235,169, Feb. 17, 1981, abandoned, and a continuation-in-part of Ser. No. 318,607, Nov. 9, 1981, abandoned, and a continuation-in-part of Ser. No. 368,730, Jun. 9, 1982, abandoned, and a continuation-in-part of Ser. No. 414,854, Sep. 3, 1982, abandoned. This application Dec. 13, 1988, Ser. No. 283,646

Int. Cl.[5] A61K *31/505, 31/07*

U.S. Cl. 514—256 **30 Claims**

1. A composition for treating alopecia comprising a retinoid and a minoxidil compound, said compound being present in an amount of about 0.01 to 30 percent by weight and said retinoid being present in an amount of about 0.001 to 2 percent by weight in said composition.

5,183,818

ARYLALKYLETHER AND ARYLALKYLTHIOETHER INHIBITORS OF LIPOXYGENASE ENZYME ACTIVITY

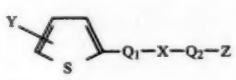
Dee W. Brooks, Libertyville; Andrew O. Stewart, Wildwood, both of Ill., and Jonathan G. Martin, Knoxville, Tenn., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Aug. 27, 1991, Ser. No. 750,362

Int. Cl.[5] A61K *31/38;* **C07D** *333/32*

U.S. Cl. 514—231.5 **7 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof wherein

X is oxygen or sulfur;

Y is one or two substituents independently selected from the group consisting of

hydrogen,

hydroxy,

halogen,

cyano,

alkyl of from one to six carbon atoms,

halogenated alkyl of from one to six carbon atoms,

alkoxy of from one to six carbon atoms,

alkylthio of from one to six carbon atoms,

alkoxy(carbocyclic aryl) in which the alkoxy portion contains from one to six carbon atoms,

alkylthio(carbocyclic aryl) in which the alkylthio portion contains from one to six carbon atoms,

(carbocyclic aryl)alkoxy in which the alkoxy portion contains from one to six carbon atoms,

(carbocyclic aryl)alkylthio in which the alkylthio portion contains from one to six carbon atoms,

(carbocyclic aryl)oxy,

(carbocyclic aryl)thio,

alkylamido of from one to six carbon atoms,

cycloalkyl of from three to eight carbon atoms,

alkanoyl of from one to six carbon atoms,

alkoxycarbonyl,

amino,

alkylamino of from one to six carbon atoms,

dialkylamino in which the two alkyl groups are independently selected from the group consisting of alkyl of from one to six carbon atoms,

—CRROR, —NRC(O)R, —NRC(O)OR, and —C(O)NRR wherein R, at each occurrence, is independently selected from hydrogen and alkyl of from one to six carbon atoms;

Q_1 is divalent alkylene of from one to six carbon atoms;

Q_2 is divalent alkylene from two to ten carbon atoms; and

Z is $N(OR_1)COR_2$ wherein

R_1 is selected from hydrogen or a pharmaceutically suitable salt, and

R_2 is selected from the group consisting of

amino,

alkylamino of from one to six carbon atoms in which the alkyl group is optionally substituted by

hydroxyl,

halogen,

alkoxy, or

carboxyl,

dialkylamino in which the alkyl groups are independently selected from one to six carbon atoms and in which the alkyl groups are optionally independently substituted by

hydroxyl,

halogen,

alkoxy, or

carboxyl,

cycloalkylamino of from three to six carbon atoms,

2-hydroxyethylamino,

N-morpholino,
N-thiomorpholino,
N-piperazino,
N'-alkyl-N-piperazino, and
cyclopropylmethylamino.

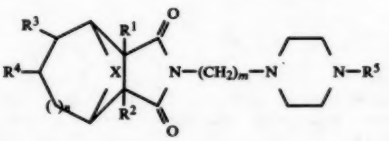
5,183,819

USE OF FUSED BICYCLIC IMIDES IN THE TREATMENT OF VARIOUS CNS DISORDERS

Magid A. M. Abou-Gharbia, Delaware, and John A. Moyer, Bucks, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 11, 1992, Ser. No. 881,443
Int. Cl.[5] A61K *31/495*
U.S. Cl. 514—255 **2 Claims**

1. A method of treating alcoholism, behavioral symptoms of Alzheimer's disease or sleep disorders which comprises administration to a mammal in need thereof a therapeutically effective amount of a compound having the formula:



wherein:

n is 0–4;

m is 2–4;

R^1 and R^2 are H or R^1 and R^2 taken together forms a 3–5 membered carbocyclic ring;

R^3 and R^4 are H or R^3 and R^4 taken together form a 3–6 membered carbocylic ring;

with a proviso that when R^1, R^2, R^3 and R^4 are other than hydrogen, n is other than zero;

X is lower alkylene, vinylene or oxygen;

R^5 is unsubstituted or substituted phenyl, 2-pyridinyl, 2-pyrimidinyl, 2-pyrazinyl or 3-pyrazinyl where the substituents are selected from lower alkyl, lower alkoxy, halo, cyano, nitro and trifluoromethyl;

or a pharmaceutically acceptable salt thereof.

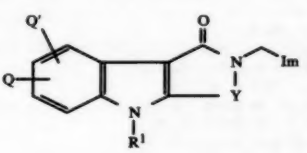
5,183,820

LACTAM DERIVATIVES

Ian H. Coates, Hertford; Alexander W. Oxford; Peter C. North, both of Royston, and Barry J. Price, Tewin Wood, all of England, assignors to Glaxo Group Limited, London, England

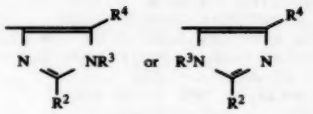
Continuation of Ser. No. 387,180, Aug. 1, 1989, abandoned. This application Apr. 26, 1991, Ser. No. 691,814
Claims priority, application United Kingdom, Aug. 2, 1988, 8818393; Feb. 23, 1989, 8904195; Feb. 28, 1989, 8904550
Int. Cl.[5] A61K *31/55*; C07D *401/14*
U.S. Cl. 514—292 **20 Claims**

1. A compound of formula (I)



(I)

wherein Im represents an imidazolyl group of the formula:



and R^1 represents a hydrogen atom or a group selected from C_{1-6}alkyl, C_{3-6}alkenyl, C_{3-10}alkynyl, C_{3-7}cycloalkyl, C_{3-7}cycloalkylC_{1-4}alkyl-, phenyl, phenylC_{1-3}alkyl-, $—CO_2R^5$, $—COR^5$, $—CONR^5R^6$ or $—SO_2R^5$ (wherein R^5 and R^6, which may be the same or different, each represents a hydrogen atom, a C_{1-6}alkyl or C_{3-7}cycloalkyl group, or a phenyl or phenylC_{1-4}alkyl- group, in which the phenyl group is optionally substituted by one or more C_{1-4}alkyl, C_{1-4}alkoxy or hydroxy groups or halogen atoms, with the proviso that R^5 does not represent a hydrogen atom when R^1 represents a group $—CO_2R^5$ or $—SO_2R^5$);

one of the groups represented by R^2, R^3 and R^4 is a hydrogen atom or a C_{1-6}alkyl, C_{3-7}cycloalkyl, C_{3-6}alkenyl, phenyl or phenylC_{1-3}alkyl- group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a C_{1-6}alkyl group;

Y represents the group CH═CH or $(CH_2)_n$, wherein n represents 2 or 3;

Q represents a halogen atom, or a group selected from hydroxy, C_{1-4}alkoxy, phenylC_{1-3}alkoxy-, C_{1-6}alkyl, cyano, phenyl which may be unsubstituted or substituted by one or more C_{1-4}alkyl, C_{1-4}alkoxy or hydroxy groups or halogen atoms, $—NR^7R^8$, $—CONR^7R^8$ or $—(CH_2)_pCONR^7R^8$ (wherein R^7 and R^8, which may be the same or different, each represents a hydrogen atom or a C_{1-4}alkyl or C_{3-4}alkenyl group; and p represents 1, 2 or 3), $—(CH_2)_qNR^9R^{10}$ (wherein R^9 represents a hydrogen atom or a C_{1-4}alkyl group, and R^{10} represents a group $—COR^{11}$ or $—SO_2R^{11}$ wherein R^{11} represents a C_{1-4}alkyl group; and q represents 0, 1, 2 or 3), or $—(CH_2)_2CO_2R^{11}$(R^{11} being as defined previously);

Q' represents a hydrogen or a fluorine atom;

or a physiologically acceptable salt or solvate thereof.

5,183,821

METHOD FOR TREATING LEUKEMIAS USING N-(2-DIMETHYLAMINOETHYL)-3-AMINO-1,8-NAPHTHALIMIDE FOR TREATING LEUKEMIAS AND SOLID TUMORS

Miguel F. Brana; Antonio M. Sanz; Rafael P. Alvarez-Ossorio; Cristobal M. Roldan; Cristina R. F. De Gamboa; Jesus G. Garcia, and Jose M. C. Berlanga, all of Madrid, Spain, assignors to Laboratories Knoll, S.A., Madrid, Spain

Continuation of Ser. No. 296,340, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 864,009, May 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 533,542, Sep. 19, 1983, abandoned. This application Jul. 8, 1991, Ser. No. 728,025
Int. Cl.[5] A61K *31/445*
U.S. Cl. 514—296 **6 Claims**

1. A method of treating a patient with leukemia, comprising administering to said patient a chemotherapeutically effective amount of N-(2-dimethylaminoethyl)-3-amino-1,8-naphthalimide.

5,183,822

SUBSTITUTED 3,4-ANNELATED BENZIMIDAZOL-2(1H)-ONES

Ineke Van Wijngaarden; Derk Hamminga, and Wouter Wouters, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

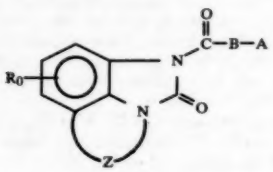
Filed Dec. 21, 1990, Ser. No. 631,957

Claims priority, application Netherlands, Dec. 27, 1989, 8903157

Int. Cl.[5] A61K *31/46;* **C07D** *519/00*

U.S. Cl. 514—305 **3 Claims**

1. A 3,4-annelated benzimidazol-2(1H)-one 1-carboxylic acid derivative of formula (1):



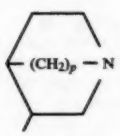
(I)

wherein

R_0 is hydrogen, alkyl, alkoxy or alkylthio having 1–4 carbon atoms, hydroxy, or halogen;

Z is ethylene or propylene, which may be substituted with 1–3 methyl groups,

A is a group of the formula (4):



(4)

wherein p has the value2, and

B is an oxygen atom or a group —N(R)—, wherein R is hydrogen, alkyl having 1–6 carbon atoms or benzyl;

or a pharmaceutically acceptable acid addition salt thereof.

5,183,823

PYRIDINE N-OXIDE COMPOUNDS WHICH ARE USEFUL AS HYPOGLYCEMIC AND HYPOLIPIDEMIC AGENTS

Takashi Sohda, Takatsuki, and Hitoshi Ikeda, Higashiosaka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

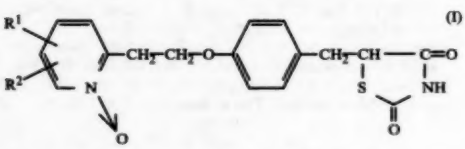
Filed Mar. 31, 1992, Ser. No. 861,280

Claims priority, application Japan, Apr. 11, 1991, 3-078835

Int. Cl.[5] C07D *417/12;* **A61K** *31/44*

U.S. Cl. 514—358 **10 Claims**

9. A pharmaceutical composition for treating diabetes comprising a thiazolidinedione derivative of the formula (I):



(I)

wherein R^1 and R^2 are the same or different and are a hydrogen atom or a lower alkyl group, or a pharmacologically acceptable salt thereof and a pharmacologically acceptable carrier or diluent.

5,183,824

AZOLE DERIVATIVES AND ANTIFUNGAL DRUGS CONTAINING THE SAME AS AN ACTIVE COMPONENT

Kimihiko Hori; Akira Sakaguchi, both of Utsunomiya; Koichi Ishida, Tochigi; Tomoko Nomura, Utsunomiya; Keiko Suzuki, Utsunomiya, and Shuichi Tsuchiya, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

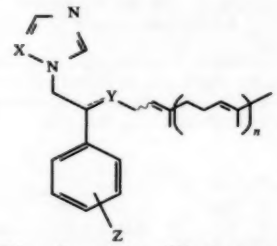
Division of Ser. No. 609,777, Nov. 7, 1990, Pat. No. 5,110,826. This application Feb. 3, 1992, Ser. No. 829,507

Claims priority, application Japan, Nov. 9, 1989, 1-290031; Feb. 6, 1990, 2-25155

Int. Cl.[5] A01N *43/653;* **C07D** *249/08*

U.S. Cl. 514—383 **2 Claims**

1. An azole derivative represented by the formula (1):



(I)

wherein X is a nitrogen atom, Y is an oxygen atom, a sulfur atom, an imino group, a methylimino group or a group represented by =N→O—, Z is one or two halogen atoms, n is 1 or 2, the wavy line indicates that the stereochemistry of the double bond is either E or Z; or an acid adduct thereof.

5,183,825

4-ARYLMETHYL-5-ALKYL-3H-PYRAZOL-3-ONES AND HYPOGLYCEMIC USE

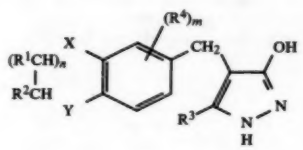
Kenneth L. Kees, Plainsboro, N.J., assignor to American Home Products Corporation, New York, N.Y.

Filed Apr. 7, 1992, Ser. No. 864,986

Int. Cl.[5] A61K *31/415;* **C07D** *231/20*

U.S. Cl. 514—404 **12 Claims**

1. A compound of the formula:



in which

the dotted lines represent optional unsaturation when n is 1 or 2;

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms or arylalkyl of 7 to 12 carbon atoms;

R^2 is hydrogen, alkyl of 1 to 6 carbon atoms, aryl of 6 to 10 carbon atoms or arylalkyl of 7 to 12 carbon atoms;

R^3 is alkyl of 1 to 3 carbon atoms, perfluoromethyl or alkoxy of 1 to 6 carbon atoms;

R^4 is halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;

X is CR^5, in which

R^5 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms, or alkoxy of 1 to 6 carbon atoms;

Y is CR^6, in which

R^6 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms;

n is one of the integers 0, 1 or 2;

m is one of the integers 0, 1, 2 or 3;

or a pharmaceutically acceptable salt thereof.

5,183,826

ANTIVIRAL AGENT

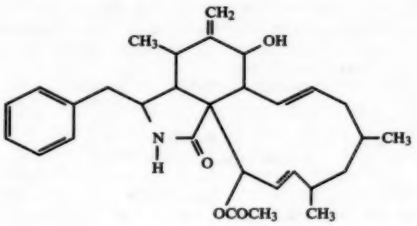
Gerald F. Bills, Rosselle; Otto D. Hensens, Redbank; Lawrence Koupal, Colonia; Russell B. Lingham, Watchung; John G. Ondeyka, Fanwood, and Deborah L. Zink, Manalpan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 25, 1990, Ser. No. 587,812

Int. Cl.[5] A61K *31/40;* C07D *209/56*

U.S. Cl. 514—411 4 Claims

1. A compound having the formula:



5,183,827

ACETYLENES DISUBSTITUTED WITH A HETEROAROMATIC GROUP AND A 2-SUBSTITUTED CHROMANYL, THIOCHROMANYL OR 1,2,3,4-TETRAHYDROQUINOLINYL GROUP HAVING RETINOID-LIKE ACTIVITY

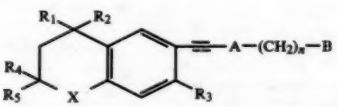
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 409,476, Sep. 19, 1989, Pat. No. 5,045,551. This application Jul. 18, 1991, Ser. No. 732,270

Int. Cl.[5] A61R *31/50*

U.S. Cl. 514—444 17 Claims

1. Compounds of the formula



where

X is S, O;

R_1, R_2 and R_3 are hydrogen or lower alkyl;

R_4 and R_5 are hydrogen or lower alkyl with the proviso that R_4 and R_5 both are not hydrogen;

n is an integer from 0 to 5;

A is selected from a group consisting of thienyl and furyl, and

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $COONR_9R_{10}$, $—CH_2OH$, CH_2OR_{11}, CH_2OCOR_{11}, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, —COR", $CR"(OR_{12})_2$, or $CR"OR_{13}O$, where R" is an alkyl, cycloalkyl or alkenyl group having 1 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenyl or lower alkylphenyl, R_9 and R_{10} independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, R_{13} is divalent alkyl radical of 1–5 carbons.

5,183,828

POLYHYDROXYBENZOIC ACID DERIVATIVES

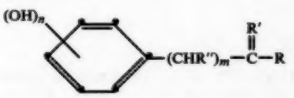
Bartholomeus van't Riet, 3419 Noble Ave., Richmond, Va. 23222; Howard L. Elford, 3313 Gloucester Rd., Richmond, Va. 23227, and Galen L. Wampler, 6938 Chamberlayne Rd., Mechanicsville, Va. 23111

Continuation-in-part of Ser. No. 302,946, Jan. 30, 1989, abandoned, which is a division of Ser. No. 907,562, Sep. 15, 1986, Pat. No. 4,942,253, which is a division of Ser. No. 497,370, May 23, 1983, Pat. No. 4,623,659. This application Jul. 20, 1990, Ser. No. 555,834

Int. Cl.[5] A61K *31/215, 31/275, 31/155, 31/165*

U.S. Cl. 514—508 2 Claims

1. A pharmaceutical formulation in unit dosage form for parenteral administration containing a compound of the following formula plus one or more pharmaceutically-acceptable excipients



in which n is 2–5m, m is 0 or 1, R" is H or OH, R' is NH or NOH and R is NH_2, NHOH or O-C_{1-3} alkyl, subject to the provisos that when R' is NH, R can only be NH_2 or NHOH and that when R' is NOH, R can only be NH_2 or O-C_{1-3} alkyl.

5,183,829

ORAL LIQUID COMPOSITIONS OF NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Henry C. Caldwell, Ambler, Pa., assignor to Applied Analytical Industries, Inc., Wilmington, N.C.

Filed Sep. 27, 1991, Ser. No. 766,774

Int. Cl.[5] A61K *31/19, 31/40*

U.S. Cl. 514—570 12 Claims

1. A one phase liquid composition for oral administration comprising:

(a) An anti-inflammatory but non-toxic quantity of a non-steroidal, anti-inflammatory drug in carboxylic acid form or a non-toxic, pharmaceutically acceptable alkali metal or ammonium salt thereof;

(b) a pharmaceutically acceptable quantity of a glycol which is propylene glycol or a polyethylene glycol selected from the range of 15–50% v/v;

(c) a quantity of ethanol selected from the range of 0–20% v/v;

(d) a pharmaceutically acceptable quantity of a polyol which is glycerin or sorbitol selected from the range of 30–80% v/v; and

(e) a pharmaceutically acceptable quantity of a dispersing agent which is polyvinylpyrrolidone, hydroxypropylcellulose or hydroxypropylmethylcellulose and which is selected form the range of 50:1 to 1:3 w/w of drug: dispersing agent.

5,183,830

METHOD FOR THE PREPARATION OF HIGHLY ELASTIC FORMS OF REDUCED COMPRESSION HARDNESS HAVING POLYURETHANE GROUPS

Volker Möhring, Mülheim/Ruhr, and Volker Zellmer, Bottrop, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Apr. 15, 1991, Ser. No. 686,127

Claims priority, application Fed. Rep. of Germany, May 7, 1990, 4014537

Int. Cl.[5] C08G *18/48*

U.S. Cl. 521—107 7 Claims

1. A method for the preparation of highly elastic polyurethane foams of reduced compression hardness by the reaction of polyisocyanate with polyether having a molecular weight of

400 to 10,000 and containing at least two hydroxyl groups in the presence of cross-linking agent, catalyst and water and optionally in the presence of emulsifier, stabilizer and organic blowing agent, comprising carrying out the reaction of the polyurethane-forming components in the presence of a compound Y which contains at least one polyoxyalkylene group and at least one group $A^{-}M^{30}$ in the molecule, wherein A is an anionic group selected from the group consisting of $—SO_3$, $—CH_2CH_2—SO_3$, $—(CH_2)_3—SO_3$, $—CH_2—CH(CH_3)—CH_2—SO_3$, $—CH_2—CH(OH)—CH_2—SO_3$, $—CH_2—CH(OH)—CH_2—S_2O_3$, —Z—COO— with Z being a divalent, optionally substituted hydrocarbon group, —CO—Z—COO—, PO_3, PO_2, $—CH_2)_n—PO_3$, $—CH_2)_n—PO_2$, with n=1, 2, 3 or 4, and wherein

M is a cation selected from the group consisting of alkali metal, alkaline earth metal, Mn, Fe, Co, Ni, Cu, Zn, Al, NH_4,

in an amount of 0.01 to 5% by weight, based on the weight of the polyether.

5,183,831

RADIATION CURABLE COMPOSITION WITH HIGH TEMPERATURE OIL RESISTANCE

Richard A. Bielat, Sterling Heights, Mich., and Kieran F. Drain, Munchenstein, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 22, 1991, Ser. No. 748,590

Int. Cl.[5] C08F *2/46*

U.S. Cl. 522—33 **30 Claims**

1. A radiation curable composition with high temperature oil resistance comprising

(1) a (meth)acrylated urethane component comprising

(a) the reaction product of hydroxyethyl(meth)acrylate and a monomeric or polymeric aromatic isocyanate,

(b) hydroxyethyl(meth)acrylate; and

(c) a (meth)acrylated prepolymer of a monomeric or polymeric aromatic isocyanate and at least one polycaprolactone polyol with a functionality>2 and a molecular weight in the range of about 500 to about 3,000;

(2) an aromatic multifunctional epoxy (meth)acrylate having a molecular weight of less than about 1000;

(3) at least one free radical polymerizable monomer; and

(4) a free radical photoinitiator,

which composition exhibits at 25° C.: : (i) a Tg greater than about 45° C., (ii) an elongation of greater than about 3%, (iii) a tensile strength of greater than about 1300 psi and (iv) a shear storage modulus of greater than about 4300 psi.

5,183,832

COATING AGENT FOR COLLAGEN-CONTAINING MATERIALS

Erik Asmussen, Farum; Erik C. Munksgaard, Kokkedal, both of Denmark; Michael Müller, Bergisch Gladbach, Fed. Rep. of Germany; Wolfgang Podszun, Cologne, Fed. Rep. of Germany, and Jens Winkel, Cologne-Pesch, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 603,594, Oct. 25, 1990, abandoned, and a continuation of Ser. No. 389,847, Aug. 4, 1989, abandoned. This application Oct. 15, 1991, Ser. No. 779,115

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3828170

Int. Cl.[5] C08F *2/50*; C08K *5/07*; C08G *2/26*

U.S. Cl. 522—84 **2 Claims**

1. A coating agent for collagen-containing materials, comprising the following ingredients:

a) 2–8% by weight of an aldehyde selected from the group consisting of formaldehyde, acetaldehyde, butyraldehyde, glutaric dialdehyde, glyoxal, benzaldehyde, salicylaldehyde, vanillin, phthalaldehyde, and furfural;

b) 15–40% by weight of a water-soluble monomer selected from the group consisting of (meth)acrylic acid, methacrylamide, hydroxyethyl methacrylate, hydroxypropyl methacrylate, ethylene glycol monomethacrylate, diethylene glycol monomethacrylate, triethylene glycol monomethacrylate, and triethylene glycol dimethacrylate;

c) 2–50% by weight bis-GMA;

d) 0.01–2.5% by weight of photoinitiator;

e) 25–60% by weight of water; and

f) 0.5–5% by weight of a constituent selected from the group consisting of acetone, butanone, methanol, ethanol, propanol, isopropanol, butanol, isobutanol, sec.-butanol, tert.-butanol, ethylene glycol monomethyl ether, tetrahydrofuran, 1,4-dioxane, the sodium salt of di-2-ethylhexylphosphate, oleyl alcohol sulphate, the sodium salt of sulphosuccinic acid dioctyl ester, methyltrioctylammonium chloride, methyltricaprylylammonium chloride, and poly-N-vinyl-2-pyrrolidone;

the total of constituents giving 100% by weight.

5,183,833

ULTRAVIOLET RADIATION PHOTOPOLYMERIZATION OF ACRYLIC ESTER PRESSURE SENSITIVE ADHESIVE FORMULATION

Dennis K. Fisher, and Brian J. Briddell, both of Jackson, Mich., assignors to Adco Products Inc., Michigan Center, Mich.

Division of Ser. No. 431,033, Nov. 2, 1989, Pat. No. 4,968,558. This application Aug. 17, 1990, Ser. No. 568,760

Int. Cl.[5] C08F *2/50, 20/18, 20/20, 20/06*

U.S. Cl. 522—182 **15 Claims**

1. A method for the preparation of a normally tacky pressure sensitive adhesive by polymerizing an acrylic ester pressure sensitive adhesive formulation substantially free of non-polymerizable solvent, said acrylic ester pressure sensitive adhesive formulation comprising non-tertiary acrylic acid alkyl ester formed from an alcohol having from about 4 to about 10 carbon atoms and an ethylenically unsaturated monomer having a polar group, or a prepolymer prepared by the partial polymerization of said monomers, characterized by:

at least partially photopolymerizing said acrylic ester pressure sensitive adhesive formulation by exposure to a source of ultraviolet radiation that provides at least about 80 percent of its radiation in the wavelength band of from about 280 to about 350 nm

and provides from about 20 to about 25 percent of its radiation of the 200 to 400 nm wavelength band within the wavelength range of below about 300 nm and from about 75 to about 80 percent of its radiation of the 200 to 400 nm wavelength band within the wavelength range of from about 300 to about 400 nm,

and has a light intensity in the wavelength band of from 200 to 400 nm of no more than about 4.0 milliwatts/cm^2 at the surface of said formulation being polymerized, said photopolymerization being continued until at least 95% of the monomer has been converted to polymer.

5,183,834

PASTY DENTAL VENEER MAKING COMPOSITION

Karl J. Gorlich, Fuerth/Odw.; Fritz U. Bauer, Liederbach, and Joerg Konetzka, Darmstadt, all of Fed. Rep. of Germany, assignors to Dentsply G.m.b.H., Dreieich, Fed. Rep. of Germany

Filed Apr. 5, 1989, Ser. No. 333,474

Int. Cl.[5] A61K *6/08*

U.S. Cl. 523—105 **6 Claims**

1. A pasty dental composition adapted for heat polymerization above about 100° C. to form a polymer useful as a dental veneer comprising by weight about

(a) 20–60% polymerizable urethane-acrylic binders,

(b) 4.0–50% crushed silanized glass fillers,

(c) 10–55% pyrogenic silica,

(d) 0.05–3% alkylacylperoxide,

(e) 0.05–3% heat activated nonperoxide initators,

(f) 0.05–2% U.V. stabilizers, and

(g) 10–60% fractured acrylic polymers.

5,183,835

EPOXIDE RESIN-MODIFIED POLYESTERS DERIVED FROM CARBOXYL POLYOL

Lutz-Werner Gross, Haltern; Ulrich Poth, Munster; Dieter Hille, Bergisch-Gladbach, and Klaus Weidemeier, Munster, all of Fed. Rep. of Germany, assignors to BASF Lacke & Farben AG, Münstér, Fed. Rep. of Germany

Continuation of Ser. No. 350,626, Apr. 25, 1989, abandoned. This application Nov. 21, 1990, Ser. No. 617,459

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636368

Int. Cl.[5] C08K *3/20;* **C08L** *63/02, 63/10, 67/02*

U.S. Cl. 523—402 **13 Claims**

1. A water dilutable coating composition for the production of heat-curable coating, in which the binder is comprised of an epoxide resin-modified, water-dilutable polyester produced by the reaction of:

A) a polyester (A) produced by polymerization:

a_1) a polycarboxylic acid containing at least three carboxyl groups or a reactive derivative thereof;

a_2) a polyol containing at least one carboxyl group other than components a_1) a_3) and a_4);

a_3) a polycarboxylic acid containing two carboxyl groups or a reactive derivative thereof, and

a_4) a polyol,

such that at least 10 mol % of the sum of components (a_1), (a_2), (a_3), (a_4), contains at least one (cyclo)aliphatic structural element having at least six carbon atoms,

said polyester (A) further having a number average molecular weight of less than 2,000, an acid number of 35 to 240 and an OH number from 56 to 320, and said (a_1) and (a_3) components in the polyester being co-condensed via at least two carboxyl groups, and

(B) 0.3 to 1.5 equivalents per polyester molecule of an epoxide resin (B) based on bisphenol and having an epoxide equivalent weight of 170 to 1,000 or a derivative thereof having at least one epoxide group per molecule, said reaction being conducted under conditions in which essentially only carboxyl groups react with epoxide groups,

said epoxide resin-modified polyester being water-dilutable after at least part of the free carboxyl groups are neutralized.

5,183,836

COMPOSITE PAINT

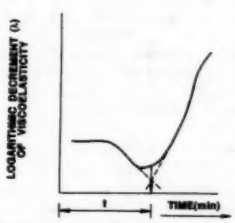
Hiroyuki Kishi, Yokohama; Hitoshi Kimura, Chigasaki; Katsuya Yamamoto, Yokohama; Yoshinobu Tamura, Sagamihara; Tsuneo Sakauchi; Nagaoka, both of Yokohama, and Yasuyu Tsuchiya, Hirakata, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Nippon Paint Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 521,863, May 11, 1990, abandoned. This application Oct. 28, 1991, Ser. No. 784,096

Claims priority, application Japan, May 18, 1989, 1-122819

Int. Cl.[5] C08K *3/20*

U.S. Cl. 523—404 **8 Claims**



1. A paint composition for coating metal surfaces to which an overlayer paint (II) is to be coated thereover, the overlayer paint having a hardening starting time as determined according to a logarithmic decrement of viscoelasticity of said overlayer paint and by an oscillated pendulum type viscoelasticity measuring device ranging from 15 to 20 minutes, said paint composition consisting essentially of:

a cathodic electrodeposition paint composition consisting essentially of:

(a) a water based composition (A) in an amount ranging from 50 to 85 parts by weight upon conversion to a solid content, said water based composition consisting essentially of:

i) a reaction product (A-1) formed by a reaction between a epoxy resin having a number average molecular weight ranging from 100 to 3000 and at least one epoxy group per molecule on an average and containing a residual bisphenol A, and a monatomic secondary amine, said reaction product being present in an amount ranging from 60 to 80 parts by weight upon conversion to a solid content, and

ii) a blocked reaction product (A-2) formed by a reaction between a compound having 1 to 8 carbon atoms and having one OH group per molecule on an average, and a compound having at least two NCO groups per molecule on an average, said blocked reaction product being present in an amount ranging rom 20 to 40 parts by weight upon conversion to a solid content; and

(b) a partially cross-linked resin (B) formed by heating a water dispersion composition, said partially cross-linked resin being present in an amount ranging from 15 to 50 parts by weight upon conversion to a solid content, said water-dispersed composition consisting essentially of:

i) a methylol phenol compound (B-1) having an average molecular weight ranging from 200 to 1000, said methylol phenol compound being formed by a reaction between phenol and formaldehyde, said methylol phenol compound being present in an amount ranging between 20 to 50 parts by weight upon conversion to a solid content, and

ii) an addition reaction product (B-2) formed by an addition of 50 to 200 millimole of a monatomic secondary amine to 100 parts by weight of a polybutadiene resin having an average molecular weight ranging from 1000 to 3000 and an oxirane oxygen concentration ranging from 4 to 8 percent by weight, said addition reaction product being present in an amount ranging from 50 to 80 parts by weight upon conversion to a solid content,

wherein said cationic electrodeposition paint composition has a minimum melt viscosity not less than 0.2 during a hardening state as determined according to the logarithmic decrement of viscoelasticity of said cationic electrodeposition paint composition and by the oscillated pendulum viscoelasticity measuring device.

5,183,837

PROCESS FOR BINDING CELLULOSIC MATERIALS WITH A BINDING AGENT OF AN AQUEOUS EMULSIONS OF POLYISOCYANATES AND CELLULOSE ETHER

Agostino Lepori, Fagnano Olona, and Domenico Camaioni, Busto Arsizio, both of Italy, assignors to Presidenza del Consiglio dei Ministri - Ufficio del Ministro per il coordinamento delle Iniziativae per la Ricerca Scientifica e Tecnologica, Rome, Italy

Division of Ser. No. 740,853, Jul. 31, 1991, Pat. No. 5,108,507, which is a continuation of Ser. No. 327,607, Mar. 23, 1989, abandoned. This application Jan. 16, 1992, Ser. No. 821,046

Claims priority, application Italy, Mar. 30, 1988, 20027 A/88

Int. Cl.[5] C08L *1/28, 1/32*

U.S. Cl. 524—13 **2 Claims**

1. A process for binding cellulosic materials selected from the group consisting of wood, bark, residues from cane sugar

extraction, straw, bamboo and rice chaff as granulates, chips, fibers or meals, for the manufacture of chipboard panels, plywood, masonite and laminate boards; the improvement comprising binding said cellulosic materials with an agent consisting of at least one organic polyisocyanate and at least one water soluble cellulose ether dissolved in water in amounts of 0.1–10% b.w.; the cellulose ether being selected from the group consisting of a carboxy-methyl-cellulose having a substitution degree greater than 0.5, a viscosity of solution at 2% in water, measured by means of the Hoppler viscometer at 20° C., within the range of from 10 to 45,000 mPa.s, and a pH value lower than 8, carboxy-methyl-ethyl-cellulose, and carboxy-hydroxy-ethyl-cellulose and wherein the organic polyisocyanate is added to the aqueous solution of said cellulose ether with a stirring speed greater than 8,000 rpm for time periods within the range of from 5 to 60 seconds.

5,183,838

ACID ANHYDRIDE COMPLEX AND PROCESS FOR PRODUCING SAME, AND COMPOSITION CONTAINING SAME

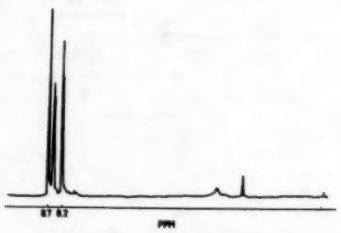
Takao Miwa, Katsuta; Takayoshi Ikeda, Tohkai; Shunichi Numata, Hitachi; Koji Fujisaki, Hitachi, and Hisae Shimanoki, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 567,160, Aug. 14, 1990. This application Jul. 2, 1991, Ser. No. 724,777

Claims priority, application Japan, Sep. 1, 1989, 1-224445

Int. Cl.[5] C08K *5/15;* **C07D** *493/02*

U.S. Cl. 524—109 **7 Claims**



1. A complex consisting essentially of an aromatic acid dianhydride and an organic base substance coordinated with the dianhydride, said base substance having a donor number of at least 20 and being free from an active hydrogen atom therein, wherein the complex has an endothermic peak of 102° to 257° C.

5,183,839

FLUOROPOLYMERS AND FLUOROPOLYMER COATINGS

Shaul M. Aharoni, Morris Plains, N.J., assignor to Allied-Signal Inc., Morristownship, N.J.

Division of Ser. No. 628,541, Dec. 17, 1990, Pat. No. 5,061,769. This application Sep. 16, 1991, Ser. No. 760,306

Int. Cl.[5] C08K *5/15*

U.S. Cl. 524—113 **5 Claims**

1. A solution in about equal volumes of tetrahydrofuran and 1,3-bis(trifluoromethyl)benzene of a polymeric composition comprising fluorinated copolymer of the formula

$$-[-X_s-Y_t-Z_u-]-$$

wherein

s, t and u represent weight proportions of the respective X, Y and Z units, and have values within the ranges of

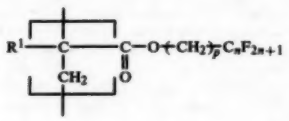
s=from about 0.5 to about 0.99;

t=from about 0.005 to about 0.495; and

u=from about 0.005 to about 0.495;

with the the sum of s+t+u being 1;

X represents units of the composition



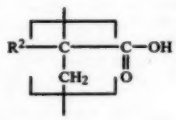
wherein

R_1 is H, $-CH_3$ or mixtures thereof;

p is 1 or 2;

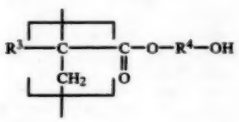
n is an integer of from about 1 to about 40;

Y represents units of the composition



wherein R^2 is H, $-CH_3$, or $-CH_2COOH$;

Z represents units of this composition



wherein

R^3 is H, $-CH_3$, or $-CH_2COOC_mH_{2m+1}$, wherein m is an integer of from about 1 to about 4; and

R^4 is an alkylene bridging group, straight chain, branched or cyclic, having from 1 to about 8 carbon atoms;

wherein the X, Y and Z units may be arranged in any sequence.

5,183,840

THERMOPLASTIC COMPOSITIONS BASED ON GRAFTED RUBBER AND POLYESTER, A PROCESS FOR THEIR MANUFACTURE, AND ARTICLES OBTAINED THEREFROM

Michel Erpelding, Saint Maximin, and Jacques Vandome, Rantigny, both of France, assignors to Societe Chimique Des Charbonnages, Paris La Defense, France

Continuation of Ser. No. 373,655, Jun. 29, 1989, abandoned, which is a division of Ser. No. 161,417, Feb. 23, 1988, Pat. No. 4,861,817, which is a continuation of Ser. No. 826,964, Feb. 7, 1986, abandoned. This application Jul. 31, 1991, Ser. No. 740,858

Claims priority, application France, Feb. 8, 1985, 85 01770

The portion of the term of this patent subsequent to Aug. 29, 2006, has been disclaimed.

Int. Cl.[5] C08L *51/04, 55/02, 67/02*

U.S. Cl. 524—228 **10 Claims**

1. Thermoplastic composition comprising:

(1) from 50 to 97% by weight based on the total weight of the thermoplastic composition of at least one polymer phase (A) comprising at least one terpolymer produced by grafting (a) at least one vinylaromatic monomer and (b) at least one unsaturated nitrile onto (c) at least one rubber, said terpolymer being dispersed in a matrix of a copolymer comprising units derived from (d) at least one unsaturated nitrile and (e) at least one vinylaromatic monomer, the

overall composition of the polymer phase (A) being such that it contains from 17 to 35 parts of unsaturated nitrile, from 10 to 60 parts of rubber, and from 10 to 60 parts of vinylaromatic monomer per 100 parts by weight of said phase,

(2) from 3 to 50% by weight based on the total weight of the thermoplastic composition of at least one high molecular weight polybutylene terephthalate (B), the polybutylene terephthalate having a molecular weight between 80,000 and 150,000 weight average molecular weight, and

(3) at least one elastomer (C) which is different from said components (A) and (B) in a proportion of up to 25 parts by weight per 100 parts of the (A)+(B) mixture,

wherein the thermoplastic composition has a Vicat softening point above 113° C. and an Izod impact strength not below 330 J/m.

5,183,841

REMOVABLE PRESSURE-SENSITIVE ADHESIVES FOR RECYCLABLE SUBSTRATES

Margaret M. Bernard, La Verne, Calif., assignor to Avery Dennison Corporation, Pasadena, Calif.

Filed Dec. 24, 1991, Ser. No. 813,354

Int. Cl.[5] C08L *93/04, 31/02, 33/08;* **C08F** *220/10*

U.S. Cl. 524—272 **36 Claims**

1. A pressure-sensitive adhesive composition which comprises:

a) an acrylic, pressure-sensitive adhesive polymer formed by emulsion polymerization, which polymer comprises, on a polymerized basis and based on the total weight of the monomers:

(i) at least one alkyl acrylate containing from about 4 to about 8 carbon atoms in the alkyl group, the total amount of alkyl acrylate monomers being at least about 35 percent by weight of the monomers; and

(ii) at least one unsaturated carboxylic acid containing from about 3 to about 5 carbon atoms, present in a total positive amount up to about 5 percent by weight of the monomers, said formed emulsion polymer being combined with:

b) for each 100 parts by weight of the formed emulsion polymer:

(i) from about 3 to about 20 parts by weight of a rosin acid tackifier and,

(ii) from about 1 to about 10 parts by weight of a rosin based surfactant,

said pressure sensitive adhesive composition when applied to a paper being capable of self-separating from a nonpaper surface of polar or nonpolar substrates in less than about 5 minutes under the action of hot water of alkali.

5,183,842

METHOD OF PRODUCING AN ORGANIC, CORROSION-RESISTANT SURFACE COATING

Robert M. O'Neil, Flixton; Emyr Phillips, Tingley, and Robert C. Wasson, Penketh, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 561,557, Aug. 1, 1990, Pat. No. 5,128,396. This application Apr. 22, 1992, Ser. No. 872,743

Claims priority, application United Kingdom, Aug. 8, 1989, 8918086

Int. Cl.[5] C08K *5/10;* **C23F** *11/00*

U.S. Cl. 524—288 **4 Claims**

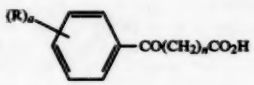
1. A method of producing an organic, corrosion-resistant surface coating on a corrodible metal surface comprising:

treating a corrodible metal surface with a composition comprising

a) an organic film-forming binder; and

b) a corrosion-inhibiting amount of a water-insoluble salt of

i) a ketoacid having the formula (I):



(I)

wherein a is 1, 2, 3, 4 or 5; the R substituents are the same or different and each is hydrogen; halogen; nitro; cyano; CF_3; C_1–C_{15} alkyl; C_5–C_{12} cycloalkyl; C_2–C_{15} alkenyl; C_1–C_{12} halogenoalkyl; C_1–C_{12} alkoxy; C_1–C_{12} thioalkyl; C_6–C_{12} aryl; C_6–C_{10} aryloxy; C_7–C_{12} aralkyl; $—CO_2R_1$ in which R_1 is a) hydrogen, b) C_1–C_{20} alkyl or said alkyl interrupted by one or more O-, N- or S-atoms, c) C_7–C_{12} aralkyl or d) C_6–C_{12} aryl or said aryl substituted with one or more carboxy groups; $—COR_1$ in which R_1 has its previous significance; NR_2R_3 in which R_2 and R_3 are the same or different and each is hydrogen or C_1–C_{24} alkyl or said alkyl interrupted by one or more O, S or NH moieties; or when a is 2, 3, 4 or 5, two adjacent groups R may be the atoms required to form a fused benzene or cyclohexyl ring; and n is an integer from 1 to 10; and

ii) an amine of formula II:

(II)

wherein X, Y and Z are the same or different, and are hydrogen; C_8–C_{24} alkyl or said alkyl interrupted by one or more O-atoms; phenyl; C_7–C_9 phenylalkyl; C_7–C_9 alkylphenyl; or two of X, Y and Z together with the N-atom to which they are attached form a 5-, 6- or 7-membered heterocyclic residue, or said residue containing a further oxygen, nitrogen or sulphur atom or said residue substituted by one or more C_1–C_4 alkyl, amino, hydroxy, carboxy or C_1–C_4 carboxy alkyl groups, and the other of X, Y and Z is hydrogen; provided that X, Y and Z are not simultaneously hydrogen;

then dry or curing the coating composition to produce a dried or cured surface coating on the metal surface.

5,183,843

POLYAMIDE RESIN COMPOSITIONS

Hideki Sakai; Kazuo Ishiwatari, and Fumitoshi Ikejiri, all of Wakicho, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sep. 21, 1989, Ser. No. 410,129

Claims priority, application Japan, Sep. 22, 1988, 63-238430; Aug. 31, 1989, 1-225754

Int. Cl.[5] C08K *5/11*

U.S. Cl. 524—318 **31 Claims**

1. A polyamide resin molding composition which comprises:

(A) as the sole polyamide of the composition an aromatic polyamide resin consisting essentially of (a) a wholly aromatic dicarboxylic acid component which consists essentially of a terephthalic acid component in amounts of 40–100 mole % and an aromatic dicarboxylic acid component other than the terephthalic acid component in amounts of 60–0 mole %, the total of the terephthalic acid component and the other dicarboxylic acid component being 100 mole % and, (b) a diamine component comprising at least one of an aliphatic diamine component and an alicyclic diamine component;

(B) a fibrous reinforcement in amount of 0–200 parts by weight in relation to 100 parts by weight of the polyamide resin; and

(C) at least one additive selected from the group consisting

of a higher fatty acid metal salt and a derivative of an aliphatic carboxylic acid of 26–32 carbons, the metal being selected from the I, II and III group metals of the periodic table, and the derivative being selected from the group consisting of an acid ester, a partially saponified ester and a metal salt, in amounts of 0.01–5 parts by weight in relation to 100 parts by weight of the polyamide resin.

5,183,844

POLY(ARYLENE SULFIDE) COMPOSITION AND METHOD USING SILICA TO REDUCE DROOL

Van C. Vives, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 2, 1990, Ser. No. 548,277
Int. Cl.[5] C08K *3/36*
U.S. Cl. 524—423 **12 Claims**

1. A composition having improved shear sensitivity comprising: poly(phenylene sulfide) in an amount in the range of from about 30% to about 65% by weight based on the total of said composition; fiberglass in an amount in the range of from about 5% to about 50% by weight based on the total weight of said composition; an additive selected from the group consisting of calcium carbonate, calcium sulfate, and talc, said additive being present in said composition in an amount in the range of from about 2% to about 58% by weight based on the total weight of said composition; and silica in an amount in the range of from about 4% to about 7.2% by weight based on the total weight of said composition, wherein said silica is a high surface silica having a surface area in the range of from about 50 to about 400 m^2/g.

5,183,845

POLYMER TREATMENT COMPOSITIONS

Jeff Parkinson, Lawrenceville, and Anthony J. O'Lenick, Jr., Lilburn, both of Ga., assignors to Siltech Inc., Norcross, Ga.

Filed Jan. 16, 1990, Ser. No. 465,986
Int. Cl.[5] C08K *5/22*
U.S. Cl. 524—726 **8 Claims**

1. An emulsion composition which comprises an admixture of the following components;

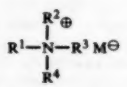
(a) a dimethylpolysiloxane;

(b) an amino functional dimethylpolysiloxane;

(c) a wetting agent, having a surface tension in water of 1% of below 30 dynes/cm^2;

(d) an emulsification compound having an HLB between 8 and 11;

(e) a cationic rain out agent which conforms to the following structure;



wherein;

R^1 R^2 R^3 and R^4 may be the same or different and are selected from alkyl, alkyl amido, aryl or heterocyclic with the proviso that a minimum of 18 carbon atoms are present in the molecule;

M is an anion needed for charge balance and is selected from halogen, or sulfate; and

(f) water.

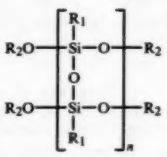
5,183,846

SILICONE LADDER POLYMER COATING COMPOSITION

Yoshiko Aiba; Hiroshi Adachi, and Etsushi Adachi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1991, Ser. No. 722,476
Claims priority, application Japan, Jul. 3, 1990, 2-178027
Int. Cl.[5] C08L *83/04*
U.S. Cl. 524—865 **4 Claims**

1. A silicone ladder polymer coating composition containing a silicone ladder polymer of the following general formula:



R_1 represents the same or different types of phenyl groups or lower alkyl groups, R_2 represents the same or different types of hydrogen atoms or lower alkyl groups, and n represents an integer of 20 to 1000, a nonpolar aromatic organic solvent being present in an amount such that solid matter occupies 5 to 30 percent by weight, and a silane coupling agent of 150 to 3000 p.p.m. with respect to said polymer, the silane coupling agent being selected from the group consisting of vinyltriethoxysilane, vinyltrimethoxysilane, β-(3,4 epoxycyclohexyl) ethyltrimethoxysilane, γ-glycidoxypropyltrimethoxysilane and γ-glycidoxypropylmethyldiethoxysilane.

5,183,847

MODIFIED CARBOXYLATED ROSIN POLYAMIDE/ACRYLICS

Sobhy El-Hefnawi, Brooklyn, N.Y.; Shailesh C. Shah, Paramus, and Basil Wasyliw, Newark, both of N.J., assignors to BASF Corporation, Parsippany, N.J.

Filed Sep. 21, 1988, Ser. No. 247,201
Int. Cl.[5] C09F *1/00, 1/04*
U.S. Cl. 525—54.44 **6 Claims**

1. An interpolymer comprising the reaction product of a polyamide, with a carboxylated rosin and acrylic or styrene/acrylic co-polymer polyelectrolyte at a temperature of 180°–250° C.

5,183,848

CONTAINER CLOSURES, SEALED CONTAINERS AND SEALING COMPOSITIONS FOR THEM

David N. Samuel, Nr Sandy, and Richard S. Williams, Impington, both of England, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 370,546, Jun. 23, 1989, abandoned. This application Jun. 7, 1991, Ser. No. 711,845
Claims priority, application United Kingdom, Jun. 29, 1988, 8815487; Aug. 26, 1988, 8820283
Int. Cl.[5] C08L *23/06, 29/02*
U.S. Cl. 525—57 **4 Claims**

1. A sealing composition having reduced oxygen permeability consisting essentially of a matrix formed of a blend of polyethylene and an elastomer selected from the group consisting of styrene butadiene styrene polymers, ethylene propylene copolymers, ethylene propylene diene copolymers and blends thereof; and an ethylene vinyl alcohol polymer.

5,183,849

POLYPHENYLENE ETHER COMPOSITION

Soichiro Yamaguchi; Koichi Matsuda, and Hideo Goto, all of Yamaguchi, Japan, assignors to Ube Cycon, Ltd., Tokyo, Japan

Filed Jun. 19, 1991, Ser. No. 717,479
Claims priority, application Japan, Jul. 10, 1990, 2-182248
Int. Cl.[5] C08L *71/12, 91/06*
U.S. Cl. 525—68 7 Claims

1. A polyphenylene ether composition, comprising 100 parts by weight of a mixture of the following components (a) and (b) and from 0.1 to 10.0 parts by weight of an acid-modified wax (c)

(a) polyphenylene ether or the combination of polyphenylene ether and an aromatic vinyl polymer and

(b) a graft copolymer obtained by emulsion polymerizing 20 to 90 parts by weight of an aromatic vinyl compound to 10 to 80 parts by weight which is reduced to rubber content, of an ethylene-propylene-nonconjugate diene copolymer rubber latex having a gel content of from 40 to 95% by weight and an average dispersed rubber particle diameter of from 0.2 to 1.0 μm by the use of a redox initiator composed of cumene hydroperoxide, ferrous sulfate, sodium pyrophosphate, and dextrose.

5,183,850

GRAFT POLYMERS AND THEIR USE AS FLAMEPROOFING AGENTS

Christian Lindner, Cologne, and Herbert Eichenauer, Dormagen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

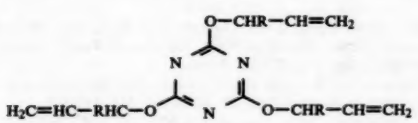
Filed Dec. 24, 1990, Ser. No. 633,028
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1990, 4000047; Apr. 5, 1990, 4010960
Int. Cl.[5] C08L *51/04*
U.S. Cl. 525—73 2 Claims

1. A flameproofed molding composition comprising:

I) 80 to 99.9% by weight of a synthetic material selected from polystyrene, polymethyl methacrylate, styrene/acrylonitrile copolymer, methyl methacrylate/styrene copolymer, styrene/maleic anhydride copolymer and graft polymers on thermoplastics containing a rubber base; and

II) 0.1 to 20% by weight of a graft polymer of

a) 5 to 95% by weight of a copolymer of 20 to 60% by weight of a 1, 3, 5-triazine derivative corresponding to formula (I)



I

in which R=H, C_{1-2} alkyl, and 40 to 80% by weight of other vinyl monomers as the graft base and

b) 5 to 95% by weight of a polymer of styrene, α-methyl styrene, p-methyl styrene, acrylonitrile, methacrylonitrile, C_{1-8} alkyl acrylates, C_{1-8} alkyl methacrylates, maleic imides, maleic anhydride, vinyl ethers, vinyl esters, ethylene, methacrylamide, acrylic acid, methacrylic acid, styrene, sulfonic acid or mixtures thereof as the graft shell.

5,183,851

LOW HAZE TRANSPARENT COMPOSITIONS AND PROCESSES FOR PREPARING THEM

Francesco Visani; Carlo Tavazzani; Giuseppe Ajroldi, all of Milan, and Giovanni Castiglioni, Locate, all of Italy, assignors to ELF Atochem ITALIA S.r.l., Milan, Italy

Continuation of Ser. No. 455,796, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 117,551, Nov. 6, 1987, abandoned. This application Sep. 3, 1991, Ser. No. 752,977
Claims priority, application Italy, Nov. 11, 1986, 22280 A/86
Int. Cl.[5] C08L *33/12, 51/04;* C08F *265/06*
U.S. Cl. 525—85 23 Claims

1. Low haze impact-resistant transparent compositions which comprise:

(a) 40–99% by weight of a thermoplastic resin based on homopolymers and/or copolymers of alkyl esters of methacrylic acid with alkyl esters of acrylic acid, wherein the alkyl group contains from 1 to 8 carbon atoms; and

(b) 60–1% by weight of polymeric particles having multilayer structure, diameters in the range from 100 to 300 nm, and coefficient of variation, relative to the average value of particle diameters, less than 0.1, constituted by 8–30% by weight of a central core, comprising:

a central core based on a cross-linked elastomer intimately blended with an acrylic resin as defined in (a) wherein the amount of elastomer is within the range of from to 0.3 to 7% by weight of the entire particle;

optionally a first layer of said acrylic resin grafted on said central core;

a second layer of cross-linked elastomer grafted on said first resin layer; and

a third layer of resin grafted on said second layer of cross-linked elastomer;

said core being made by the following steps:

(i) preparing a seed of elastomer in aqueous emulsion by feeding and polymerizing monomers selected from the alkyl or alkoxylalkyl esters of acrylic acid, wherein the alkyl group contains from 1 to 8 carbon atoms, and those containing a double ethylenic unsaturation, optionally in mixture with amounts of vinylic monomer of up to 30% by weight, and containing from 0.5 to 2% by weight of grafting monomers;

(ii) swelling of the above seed, by absorption of one or more monomers selected from the alkyl esters of methacrylic acid, wherein the alkyl group contains from 1 to 8 carbon atoms, optionally in admixture with minor amounts of C_1–C_8 alkyl or alkoxy-alkyl esters of acrylic acid, and containing 0.05–2% by weight of grafting monomers, said swelling being carried out to such an extent to obtain final particles w[illegible]ove-mentioned coefficient of variation of diamet[illegible]nd

(iii) polymerizing said alkyl esters absorbed in the elastomeric seed, to yield the central core.

5,183,852

POLYBLENDS CONTAINING POLYURETHANE, POLYMER AND SILOXANE CROSSLINKER

Peter M. Gomez, Northampton, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 22, 1991, Ser. No. 703,959
Int. Cl.[5] C08F *8/32*
U.S. Cl. 525—101 9 Claims

1. A polyblend comprising

(a) from 20% to 89% by weight of a polyurethane;

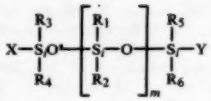
(b) from 10% to 70% by weight of a polymer comprising:

1. from 10% to 95% of a vinylaromatic monomer;

2. from 5% to 50% of a polymerisable unsaturated dicarboxylic acid; and

3. from 0% to 50% of a polymerisable ester of an unsaturated carboxylic acid;

(c) from 1% to 25% by weight of a siloxane crosslinker having the formula



wherein, R_1, R_2, R_3, R_4, R_5 and R_6 independently represent a straight, branched, or substituted alkyl group having from 1 to 8 carbon atoms or a carbocyclic group, having 5 to 6 carbon atoms, m is an integer such that the molecular weight of the resulting siloxane is from 1,500 to 60,000 and X and Y individually represents a terminal group carrying a reactive moiety independently selected from the group consisting of amine, hydroxy or epoxy moieties.

(d) from 0% to 50% by weight of a further polymeric ingredient;

wherein the amounts of components (a), (b), (c) and (d) total 100%.

5,183,853

ARTICLES OF A NEW CRYSTALLINE FORM OF SYNDIOTACTIC STYRENE POLYMER

Gaetano Guerra, Salerno; Vincenzo M. Vitagliano; Paolo Corradini, both of Napoli, and Enrico Albizzati, Arona, all of Italy, assignors to Himont Incorporated, Wilmington, Del.

Filed Feb. 27, 1990, Ser. No. 485,928

Claims priority, application Italy, Feb. 28, 1989, 19588 A/89

Int. Cl.[5] C08L *71/12;* **C08F** *6/00, 12/08*

U.S. Cl. 525—132 **6 Claims**

1. A manufactured article comprising syndiotactic styrene polymer, wherein the styrene polymer is predominantly in crystalline beta' form having an X-ray spectrum having maximum intensity reflections at 2θ equal to 12.2° and 20° and no appreciable intensity reflection at 2θ from 15° to 18° and obtained by processing the melt of the syndiotactic styrene polymer at a temperature of 50° C. higher than the melting temperature of said polymer.

5,183,854

Patent Not Issued For This Number

5,183,855

GRAFT COPOLYMER BASED ON AN ULTRAHIGH-MOLECULAR-WEIGHT POLYETHYLENE AND AN ETHYLENE COPOLYMER

John Hobes, Dinslaken, and Christiane Barth, Oberhausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 19, 1991, Ser. No. 762,607

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1990, 4030565

Int. Cl.[5] C08L *23/08, 23/26*

U.S. Cl. 525—193 **21 Claims**

1. A graft copolymer containing from 5 to 50 parts by weight of polyethylene having a molecular weight of at least 1,000,000 g/mol and constituting Base Polymer I; 95 to 50 parts by weight of a Base Polymer II comprising 10% to 50% by weight of vinyl acetate or alkenecarboxylic acid ester and 50% to 90% by weight of ethylene; and 0.5 to 3.0 parts by weight of alkenecarboxylic acid or alkenecarboxylic anhydride per 100 parts of Base Polymers I and II, as a graft monomer.

5,183,856

THERMOPLASTIC ELASTOMER AND A PROCESS FOR ITS PRODUCTION

Sadao Kitagawa, and Mitushige Baba, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Feb. 22, 1991, Ser. No. 659,504

Claims priority, application Japan, Feb. 23, 1990, 2-42774; Feb. 23, 1990, 2-42775; Apr. 18, 1990, 2-102138

Int. Cl.[5] C08F *265/04;* **C08L** *33/08*

U.S. Cl. 525—282 **9 Claims**

1. A process for producing a thermoplastic elastomer which comprises:

polymerizing an acrylic ester in the presence of a polyfunctional monomer having in its molecule at least two ethylenically unsaturated bonds, thereby forming a crosslinked acrylic rubber having a glass transition temperature of 0° C. or lower in an amount of 55–90 parts by weight per 100 parts by weight of the final polymer composition; and

adding a methacrylate ester and a maleimide to the acrylic rubber so as to carry out copolymerization, thereby forming a methacrylate ester/maleimide copolymer having a glass transition temperature of 110° C or higher in an amount of 45-10 parts by weight per 100 parts by weight of the final polymer composition.

5,183,857

MODIFIED BLOCK COPOLYMER AND A PROCESS FOR PRODUCING THE SAME

Toshinori Shiraki, Yamato; Fusakazu Hayano, Chigasaki, and Hideo Morita, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 113,238, Oct. 27, 1987, Pat. No. 4,927,889, which is a division of Ser. No. 847,257, Apr. 2, 1986, Pat. No. 4,820,768, which is a division of Ser. No. 432,923, Sep. 20, 1982, Pat. No. 4,628,072. This application Nov. 30, 1989, Ser. No. 443,188

Claims priority, application Japan, Aug. 13, 1981, 56-125882; Aug. 24, 1981, 56-131650

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] C08F *257/00*

U.S. Cl. 525—285 **32 Claims**

1. A modified block copolymer comprising a linear base block copolymer of at least two monovinyl substituted aromatic hydrocarbon polymer blocks and at least one olefin compound polymer block having an ethylenic unsaturation degree not exceeding 20%, said linear base block copolymer having at least one maleic anhydride unit non-radically grafted thereonto, said linear base block copolymer having a monovinyl substituted aromatic hydrocarbon content of 5 to 95% by weight.

5,183,858

CORE-SHELL POLYMER, PRODUCTION AND USE THEREOF

Ichiro Sasaki, Suita; Junji Oshima, Toyonaka, and Minoru Yamada, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 501,761, Mar. 30, 1990, abandoned. This application Dec. 19, 1991, Ser. No. 810,439

Claims priority, application Japan, Mar. 31, 1989, 1-081826

Int. Cl.[5] C08F *279/02, 265, 04, 265, 06;* **C08L** *59/02*

U.S. Cl. 525—308 **7 Claims**

1. A core-shell polymer comprising a rubbery polymer core consisting essentially of (a) a conjugated diene, (b) a C_{2-8} alkyl acrylate, (c) a mixture of C_{2-8} alkyl acrylates, (d) a mixture of a conjugated diene and a C_{2-8} alkyl acrylate or (e) a mixture of (a) or (b) and at least one monomer copolymerizable therewith selected from the group consisting of an aromatic vinyl monomer, an aromatic vinylidene monomer, a vinyl cyanide, a vinylidene cyanide and an alkyl methacrylate and a glassy

polymer shell which is formed from methyl methacrylate or a mixture of methyl methacrylate and at least one monomer copolymerizable therewith selected from the group consisting of an alkyl acrylate, an alkyl methacrylate, an aromatic vinyl monomer, an aromatic vinylidene monomer, a vinyl cyanide and a vinylidene cyanide, the transition temperature of the glassy polymer being not less than 60° C., the core-shell polymer having substantially no detectable anion.

5,183,859

POLYMER PARTICLES, PRODUCTION AND USE THEREOF

Ichiro Sasaki, Suita; Junji Oshima, Toyonaka, and Minoru Yamada, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 8, 1989, Ser. No. 433,201

Claims priority, application Japan, Nov. 9, 1988, 63-282862

Int. Cl.[5] C08F *265/06, 279/02, 265/04*

U.S. Cl. 525—309 **11 Claims**

1. A polymer particle comprising (1) a rubbery polymer core comprised of conjugated diene elastomers, C_{2-8} alkyl acrylate elastomers or mixtures thereof and (2) a methacrylic glassy polymer shell as formed in latex interpenetrating polymer networks, which is formed by swelling 100 parts by weight of the rubbery polymer with 10 to 200 parts by weight of a swelling solvent wherein the swelling solvent is miscible with methacrylic monomers and carrying out an emulsion polymerization reaction of the methacrylic monomers in the presence of the resultant swollen rubbery polymer.

5,183,860

IMPACT RESISTANT MOLDABLE POLYACETAL RESIN COMPOSITIONS AND PROCESSES FOR MAKING SAME

Osamu Kashihara, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan

Filed Mar. 25, 1991, Ser. No. 673,984

Claims priority, application Japan, Mar. 28, 1990, 2-82330

Int. Cl.[5] C08L *61/02;* **C08G** *18/56*

U.S. Cl. 525—398 **15 Claims**

1. A moldable polyacetal resin composition comprising a polyacetal base resin ad an impact resistant effective amount of a thermoplastic polyurethane resin melt-blended with said polyacetal base resin, wherein said polyacetal base resin consists essentially of a mixture of (A_1) a low hydroxyl-containing polyacetal resin having less than 50 mmol/kg hydroxyl groups in its molecule, and (A_2) a high hydroxyl-containing polyacetal resin having between 70 to 300 mmol/kg hydroxyl groups in its molecule, and wherein said high hydroxyl-containing polyacetal resin and said low hydroxyl-containing polyacetal resin are respectively present in a weight ratio A_1:A_2 of between 97:3 to 70:30.

5,183,861

POLYALKYLOXAZOLINE/POLYLACTONE COPOLYMERS, PROCESSES FOR MAKING, AND USES

Judy S. Riffle; Gurudus D. Sinai-Zingde, and Andrew E. Brink, all of Blacksburg, Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Filed May 23, 1989, Ser. No. 355,709

Int. Cl.[5] C08G *63/91*

U.S. Cl. 525—413 **4 Claims**

1. A block copolymer comprising as respective polymer units poly(2-oxazoline) and polylactone moieties.

5,183,862

HYPERBRANCHED POLYESTERS

Garret D. Figuly, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 548,681, Jun. 22, 1990. This application Apr. 9, 1992, Ser. No. 865,599

Int. Cl.[5] C08F *20/00*

U.S. Cl. 525—437 **5 Claims**

1. A capped polyester prepared by capping the X and Y functions of a soluble hyperbranched polyester having at least 1 branch per 10 monomer units prepared by conventional polycondensation of one or more monomers of the formula:

$$XR^2_n$$

wherein:

R^1 is a divalent C_{1-12} hydrocarbyl radical which is linear or branched aliphatic, alicyclic, aromatic or mixed aromatic-aliphatic;

R^2 is a C_{1-12} hydrocarbyl radical having a valence of (n+1), which radical is linear or branched aliphatic, alicyclic, aromatic or mixed aromatic-aliphatic, or R^2 is R^3N wherein R^3 is defined as for R^1;

either of R^1, R^2 or R^3 optionally also containing substituents that are unreactive under processing conditions;

X and Y are terminal functions selected from $—CO_2R'$ and —OR" wherein R^1 is H or C_{1-12} alkyl and R" is H or OC(O)R;

m is 0 or 1; and

n is an integer and is at least 2;

with the provisos that:

(i) both X and Y are not $—CO_2R'$ or —OR";

(ii) no X or Y function is adjacent to another X or Y function;

(iii) when R^2 is an aliphatic hydrocarbyl radical, Y is $—CO_2R'$; and

(iv) when R^2 is R^3N, m is 1; with a monofunctional capping agent.

5,183,863

VISCOELASTIC RESIN COMPOSITION FOR VIBRATION-DAMPING MATERIAL

Masanori Nakamura; Hiroshi Hirakouchi; Takeshi Yatsuka, all of Shiga; Nobuo Kadowaki, and Hiroshi Endoh, both of Chiba, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka and Nippon Steel Corporation, Tokyo, both of, Japan

Filed May 29, 1992, Ser. No. 890,116

Claims priority, application Japan, May 31, 1991, 3-157643

Int. Cl.[5] C08G *18/42*

U.S. Cl. 525—438 **11 Claims**

1. A viscoelastic resin composition for a vibration damping material comprising (A) at least one low specific gravity amorphous polyester resins wherein 40 mol % or more of the dibasic acid component is an aromatic dicarboxylic acid, (B) at least one high specific gravity amorphous polyester resins wherein 80 mol % or more of the dibasic acid component is an aromatic dicarboxylic acid and (C) at least one hardener selected from the group consisting of polyisocyanate compounds, epoxy group-containing compounds and acid anhydrides, characterized in that the difference in molecular weight between (A) and (B) is 10,000 or more, the molecular weight of one of (A) and (B) is 5,000 or higher, the difference in specific gravity at 30° C. between (A) and (B) is within the range of 0.06–0.15, and the weight ration (A):(B) is within the range of 90:10–30:70.

5,183,864

POLYAMIDE BLENDS BY REACTIVE PROCESSING

Robert G. Nelb, II, Midland, Mich., and Kemal Onder, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 247,789, Sep. 22, 1988, abandoned. This application Jul. 27, 1990, Ser. No. 558,955

Int. Cl.[5] C08L 77/10, 79/08, 59/02, 69/00

U.S. Cl. 525—452 30 Claims

1. A process for the preparation of a thermoplastic polymer blend containing at least one first thermoplastic polymer and a second thermoplastic polymer, the second thermoplastic polymer having recurring imide and/or amide linkages which process comprises (a) mixing the first thermoplastic polymer with an organic diisocyanate and a polycarboxylic compound selected from the class consisting of a dicarboxylic acid, a tricarboxylic acid or anhydride thereof, and mixtures of said dicarboxylic and tricarboxylic acid or anhydride thereof at a temperature below the melting point of the first polymer and (b) reactively processing the mixture of step (a) whereby the second thermoplastic polymer is formed by the reaction of the organic diisocyanate with the polycarboxylic compound in the presence of said first polymer thereby forming said thermoplastic polymer blend.

5,183,865

THERMOSETTABLE POWDER COMPOSITIONS OF POLYMALEIMIDE AND ALLYL-FUNCTIONAL PREPOLYMER

Mohinder S. Chattha, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 289,856, Dec. 27, 1988, abandoned. This application Jan. 16, 1991, Ser. No. 642,103

Int. Cl.[5] C08L 63/10, 67/06, 79/02, 81/02

U.S. Cl. 525—530 6 Claims

1. A shelf stable, powder composition adapted to form a high T_g, thermally stable, impact resistant thermoset material, which composition consists essentially of an intimate mixture of two components:

(A) an allyl-functional prepolymer component: (i) having a number average molecular weight between about 300 and about 3000 and (ii) being the reaction product of:

(a) an aromatic allyl-functional compound additionally containing a first reactive functionality; and

(b) a modifying compound containing a second reactive functionality capable of reacting with said first reactive functionality of compound (a), said first reactive functionality and said second reactive functionality being selected from the following reactive functionality pair: epoxide and amine, said compound (a) and compound (b) being reacted in an amount sufficient to react substantially all of said amine and epoxide functionalities which may be present on said compound (a) and compound (b); and

(B) polymaleimide component,

said allyl-functional prepolymer component and said polymaleimide component being present in said composition in amounts sufficient to provide between about 0.8 and 1.2 maleimide groups of said polymaleimide component for each allyl group present on said allyl-functional prepolymer component.

5,183,866

POLYMER RECOVERY PROCESS

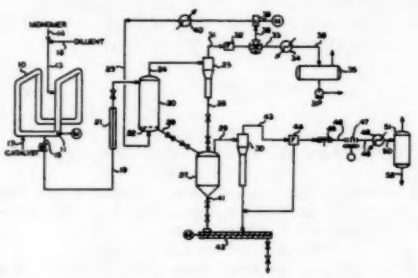
John D. Hottovy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 30, 1989, Ser. No. 400,620

Int. Cl.[5] C08F 2/14

U.S. Cl. 526—88 20 Claims

1. A polymerization process comprising polymerizing monomers in a liquid diluent to produce a liquid slurry containing particles of normally solid polymer, periodically opening a product takeoff valve port to allow a charge of said liquid slurry of particles to flow into an elongated confined zone comprising a flash line heater and then into a flash chamber wherein the lighter components are separated from said particles, further characterized by the fact that the elongated confined zone is constructed such that the flow time of said charge of slurry in said elongated confined zone is equal to at least about 25% of the time between the closing of the product takeoff valve and the next opening of the settling leg valve.



5,183,867

POLYMERIZATION PROCESS USING A NEW SUPPORTED POLYMERIZATION CATALYST

Howard C. Welborn, Jr., Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 906,103, Sep. 10, 1986, Pat. No. 5,077,255. This application Aug. 22, 1991, Ser. No. 748,378

Int. Cl.[5] C08F 4/606, 10/00

U.S. Cl. 526—114 12 Claims

1. A process for polymerizing α-olefins either alone or in combination with one or more other olefins, said process comprising contacting said α-olefins either alone, or in combination with one or more other olefins, with a supported reaction product obtained by reacting at least one metallocene of a metal of Group IVB, VB and VIB of the Periodic Table of Elements at least one non-metallocene transition metal compound of a metal of Group IVB, VB, and VIB and an alumoxane in the presence of a support material consisting essentially of silica, alumina or silica-alumina.

5,183,868

OLEFIN POLYMERIZATION OVER PI-OLEFIN COMPLEX OF CHROMIUM SUPPORTED ON ALUMINOPHOSPHATE

Kim W. Nordquest, Rocky Mount, N.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 23, 1990, Ser. No. 556,631

Int. Cl.[5] C08F 4/69, 4/622

U.S. Cl. 526—155 13 Claims

1. A polymerization process which comprises contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule with a catalyst system comprising a pi-olefin complex of chromium (-1) supported on an activated aluminophosphate support wherein said pi-olefin is cycloheptatrienyl-(1,3-cycloheptadiene), or an alkyl substituted derivative thereof.

5,183,869

HARDENABLE COMPOSITIONS

Andreas Kramer, Düdingen; Rudolf Brunner, Belfaux, and Abdul-Cader Zahir, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 14, 1991, Ser. No. 699,541

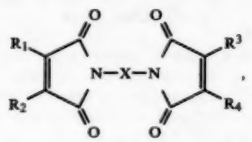
Claims priority, application Switzerland, May 18, 1990, 1702/90

Int. Cl.[5] C08F *26/06*

U.S. Cl. 526—262 **12 Claims**

1. A composition comprising:

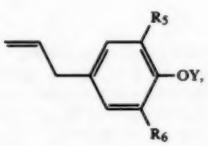
(A) a compound of formula I



(I)

wherein R_1, R_2, R_3 and R_4 are identical or different and each is hydrogen or methyl, and X is a divalent organic radical comprising 2 to 60 carbon atoms,

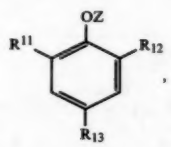
(B) a compound of formula II



(II)

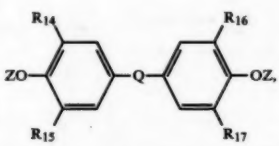
wherein R_5 and R_6 are identical or different and each, independently of the other, is C_1–C_8alkyl, and Y is hydrogen or an allyl radical, and

(C) an alkenylphenol of formula IV, V or VI



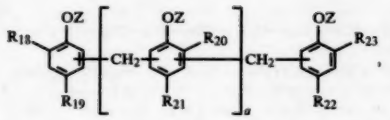
(IV)

wherein each of R_{11}, R_{12} and R_{13}, independently of the others, is a hydrogen atom or a C_3–C_{10}alkenyl group, at least one of the radicals R_{11} to R_{13} being an alkenyl group, and Z is hydrogen, C_1–C_{10}alkyl, C_6–C_{10}aryl or C_3–C_{10}alkenyl,



(V)

wherein Q is a direct bond, methylene, 2,2-propylidene, —CO—, —O—, —S—, —SO— or —SO_2—, and each of R_{14}, R_{15}, R_{16} and R_{17}, independently of the others, is a hydrogen atom or a C_3–C_{10}alkenyl group, at least one of the radicals R_{14} to R_{17} being an alkenyl group, and Z is hydrogen, C_1–C_{10}alkyl, C_6–C_{10}aryl or C_3–C_{10}alkenyl,



(VI)

wherein each of R_{18}, R_{19}, R_{20}, R_{21}, R_{22} and R_{23}, independently of the others, is a hydrogen atom, C_1–C_4alkyl or C_3–C_{10}alkenyl, at least one of the radicals R_{18} to R_{23} being an alkenyl group, and a is a number from 0 to 10, and Z is hydrogen, C_1–C_{10}alkyl, C_6–C_{10}aryl or C_3–C_{10}alkenyl.

5,183,870

COMPOSITION FOR PLASTIC LENSES

Hiroshi Fukushima; Akira Motonaga; Eriko Suda, all of Nagoya; Mikito Nakajima, Suwa; Katsuyoshi Takeshita, Suwa, and Yusuke Kutsukake, Suwa, all of Japan, assignors to Mitsubishi Rayon Co., Ltd and Seiko Epson Corporation, both of Tokyo, Japan

Filed Feb. 7, 1991, Ser. No. 651,945

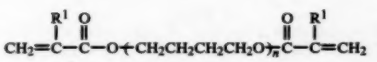
Claims priority, application Japan, Feb. 8, 1990, 2-27118; Feb. 19, 1990, 2-36148; Jul. 5, 1990, 2-176223; Jul. 5, 1990, 2-176224

Int. Cl.[5] C08F *24/00*

U.S. Cl. 526—273 **8 Claims**

1. A composition for plastic lenses which comprises

(A) 10 to 60 parts by weight of a polybutylene glycol di(-meth)acrylate represented by the general formula (I):

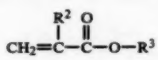


(I)

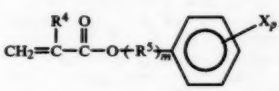
where R^1 is hydrogen or methyl, and n is an integer of 5 to 16;

(B) 20 to 80 parts by weight of at least one compound selected from the group consisting of a urethane poly(meth-)acrylate having two or more (meth)acryloyloxy groups in the molecule, and an epoxy poly(meth)acrylate having two or more (meth)acryloyloxy groups in the molecule;

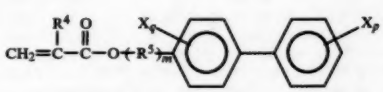
(C) 5 to 60 parts by weight of at least one mono(meth)acrylate selected from the group consisting of compounds represented by the general formulae (II), (III), (IV) and (V):



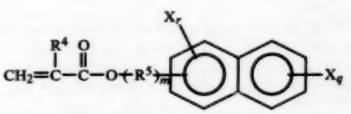
(II)



(III)

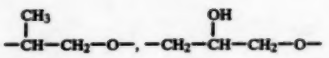


(IV)



(V)

where R^2 is hydrogen or methyl, R^3 is an alicyclic hydrocarbon radical having 5 to 16 carbon atoms, R^4 is hydrogen or methyl, R^5 is —CH_2—, —CH_2CH_2—O—,



or $-CH_2CH_2CH_2CH_2-O-$, X is chlorine, bromine or iodine, m is an integer of 0 to 3, p is an integer of 0 to 5, q is an integer of 0 to 4, and r is an integer of 0 to 3; and

(D) 0 to 60 parts by weight of a compound having at least one polymerizable double bond in the molecule,

with the total amount of components (A), (B), (C) and (D) being 100 parts by weight.

5,183,871

STYRENE POLYMER MOLDING MATERIAL AND PROCESS FOR PREPARING SAME

Komei Yamasaki, Chiba, and Funaki Keisuke, Ichihara, both of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed May 14, 1990, Ser. No. 523,065

Claims priority, application Japan, May 31, 1989, 135940

Int. Cl.[5] C08L *25/04*

U.S. Cl. 526—347.2 **13 Claims**

1. A molding material of styrene polymer having a high degree of syndiotacticity, a weight average molecular weight of 50,000 or more, and at least one melting point in the surface layer or subsurface parts thereof of the molding material in the range of 285° C. to 300° C. and, if present, an inner portion having a conventional syndiotactic configuration and a melting point no higher than 275° C., as measured by differential scanning calorimeter with a temperature rising rate of 20° C./min.

5,183,872

PROCESS FOR THE PEPARATION OF FINELY DIVIDED, WATER-SWELLABLE POLYSACCHARIDE GRAFT POLYMERS

Klaus Heidel, and Sigrid Scholz-Weigl, both of Marl, Fed. Rep. of Germany, assignors to Starchem GmbH, Krefeld, Fed. Rep. of Germany

Filed Oct. 25, 1991, Ser. No. 782,805

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1990, 4034882

Int. Cl.[5] C08F *251/00, 2/18;* A61F *13/15;* A61L *15/22*

U.S. Cl. 527—300 **11 Claims**

1. In a process for the preparation of finely divided, porous and rapidly water-swellable polysaccharide graft polymers, comprising the steps of semicontinuous reverse-phase suspension polymerization, partial dewatering and crosslinking, the improvement being that during the suspension polymerization step,

an aqueous solution containing from 60 to 95 parts of an olefinically unsaturated carboxylic acid which has been neutralized to the extent of from 50 to 100%,

from 0 to 50 parts of at least one other olefinically unsaturated monomer,

from 0 to 2 parts of crosslinking agent and

from 0.005 to 5 parts of polymerization initiator, is added continuously at from 40° to 100° C. over the course of from 0.5 to 5 hours to a suspension of from 5 to 40 parts of polysaccharide and from 0 to 2 parts of polymerization initiator in a nonpolar organic solvent which contains 1 to 10% by weight, based on the total weight of said olefinically unsaturated carboxylic acid, of a dispersant mixture of

(a) from 50 to 100% by weight of nonionic surfactant having a hydrophilic-lipophilic balance of 0.5 to 10, and

(b) from 0 to 50% by weight of nonionic surfactant having a hydrophilic-lipophilic balance of from 10.5 to 20, and wherein,

after from 75 to 100% of the aqueous monomer containing solution has been added, 0.2 to 4% by weight, based on the total weight of said olefinically unsaturated carboxylic acid, of an additional dispersant selected from the group consisting of an amphoteric ammonium compound containing an alkyl radical having 6 to 20 carbon atoms, a quaternary imidazolinium salt containing an alkyl radical having 6 to 20 carbon atoms, and mixtures thereof is added.

5,183,873

ROOM TEMPERATURE STABLE ORGANOPOLYSILOXANE COMPOSITIONS

George J. Vikne, Delagacion Tlalpan, Mexico, assignor to Wacker Silicones Corporation, Adrian, Mich.

Filed Oct. 21, 1991, Ser. No. 779,748

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—16 **16 Claims**

1. A composition which is stable at room temperature, but when heated to an elevated temperature cures to an elastomeric solid which comprises (A) an organopolysiloxane having silicon bonded hydroxyl groups, (B) a crosslinking agent selected from the group consisting of

(a) a silane of the formula

$$R_mSi(Z)_{4-m},$$

(b) partial hydrolyzates of silane (a) and

(c) an organohydrogenpolysiloxane of the average unit formula

$$R_nHSiO_{3-n}$$

where R is selected from the group consisting of a monovalent hydrocarbon radical having from 1 to 18 carbon atoms and a substituted monovalent hydrocarbon radical having from 1 to 18 carbon atoms, Z is selected from the group consisting of a hydrocarbonoxy group of the formula (—OR′) and a hydrocarbonoxy-hydrocarbonoxy group of the formula (—OR″OR′), where R′ is a monovalent hydrocarbon radical having from 1 to 10 carbon atoms, R″ is a divalent hydrocarbon radical having from 2 to 10 carbon atoms, m is an integer of from 0 to less than 2 and n is an integer greater than 0, but less than 2 and (C) an aluminum salt of a carboxylic acid having from 8 to 18 carbon atoms which is solid at room temperature.

5,183,874

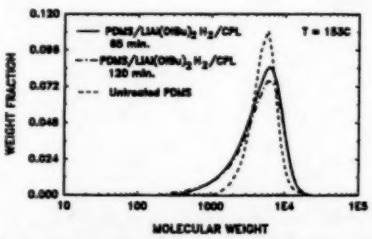
POLYORGANOSILOXANE-POLYAMIDE BLOCK COPOLYMERS

Cary A. Veith, Arlington, Va., assignor to Technical Development Associates, Copley, Ohio

Filed Oct. 18, 1990, Ser. No. 599,475

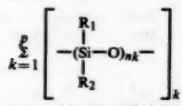
Int. Cl.[5] C08G *77/06*

U.S. Cl. 528—16 **11 Claims**



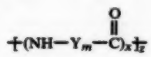
1. A process for preparing a block copolymer having a polyorganosiloxane block [B] having a number average molecular weight of about 10 kg/mole to about 150 kg/mole of the formula:

[B]



and a polyamide block [A] having a number average molecular weight of about 15 kg/mole to about 130 kg/mole of the formula:

[A]



wherein R_1 and R_2 are the same or different within each organosiloxane block and wherein R_1 and R_2 may vary among the p different organosiloxane blocks and are independently selected from the group consisting of alkyl having from 1 to 18 carbon atoms, aryl, alkenyl having from 1 to 12 carbon atoms and combinations thereof,

n_k is the number average degree of polymerization of the organosiloxane block and is from about 3 to 7000,

k is an integer from 1 to p,

p is the total number of organosiloxane blocks in the polyorganosiloxane block [B] and is an integer greater than or equal to one,

n is the overall number average degree of polymerization of the entire polyorganosiloxane block [B] and is an integer of from about 3 to 7000,

Y_m is an alkylene having from 3 to 13 carbon atoms,

l is the total number of different cyclic lactam monomers in the polyamide block [A] and is an integer greater than or equal to one,

m is an integer of from 1 to l,

x is an integer greater than or equal to one, and

z is the overall polyamide block number average degree of polymerization and is an integer of from about 15 to 1200;

comprising mixing together an N-acyllactam functionalized homo- or copolyorganosiloxane, one or more cyclic lactam monomers of the formula:

and a catalyst of the formula:

$$LiAl(OR)_jH_{4-j}$$

wherein j=1, 2 or 3 and R is an alkyl having from 1 to 18 carbon atoms or an aryl to form the block copolymer.

5,183,875

METHOD FOR MANUFACTURING A HAFNIUM-CONTAINING SILAZANE POLYMER AND A METHOD FOR MANUFACTURING A CERAMIC FROM SAID POLYMER

Yoshihumi Takeda, Niigata, and Akira Hayashida, Tokyo, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1990, Ser. No. 630,063

Claims priority, application Japan, Dec. 20, 1989, 1-330108

Int. Cl.[5] C08G *77/04*

U.S. Cl. 528—33 **10 Claims**

1. A method for manufacturing a hafnium-containing silazane polymer comprising reacting, under conditions to effect polymerization in a water-free atmosphere and at a temperature between about 25° C. and 350° C., a mixture of

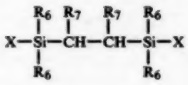
(A) a halide of an organic silicon compound selected from the group consisting of:

[III]

wherein R_4 and R_5 may be the same or different and are hydrogen, chlorine, bromine, methyl, ethyl, phenyl or vinyl and X is chlorine or bromine;

a compound having the formula:

[IV]



wherein R_6 is hydrogen, chlorine, bromine, methyl, ethyl, phenyl or vinyl, R_7 is hydrogen or methyl, and X is chlorine or bromine;

and mixtures thereof;

(B) a hafnium compound having the formula:

$$HfX_4 \qquad [I]$$

wherein X is chlorine or bromine; and

(C) a disilazane having the formula

[II]

wherein R_1, R_2 and R_3 may be the same or different and are hydrogen, methyl ethyl, phenyl or vinyl.

5,183,876

UREA GROUP-CONTAINING POLYISOCYANATES MODIFIED WITH LONG CHAIN COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

Richard Kopp, Cologne; Gerhard Grögler, Leverkusen, and Heinrich Hess, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 383,948, Jul. 21, 1989, abandoned. This application Feb. 6, 1991, Ser. No. 651,693

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 3826447

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—59 **13 Claims**

1. A modified urea group-containing polyisocyanate which is prepared by a process which comprises

a) reacting a starting polyisocyanate which is free from urea groups with a long chain compound having a molecular weight of about 800 to 6,000 and

b) subsequently reacting the modified polyisocyanate produced in a) with water to form urea groups in an inert reaction medium or in an aqueous mixture containing a dispersion stabilizer.

5,183,877

POLYUREA OR POLYUREA-URETHANE ADHESIVE FOR BONDING ELASTOMERS

Sandra K. M. Swanson, West St. Paul, Minn., assignor to H.B. Fuller Company, Minneapolis, Minn.

Filed Oct. 25, 1991, Ser. No. 782,578

Int. Cl.[5] C08G *18/10*

U.S. Cl. 528—64 **13 Claims**

1. As a polyurea adhesive composition formed by mixing two parts (A and B) together in predetermined relative amounts, Part A and Part B comprising, respectively:

Part A—a mixture of

a) a synthetic polymer of di-p-aminobenzoate containing a poly(tetramethyleneglycol) (PTMEG) backbone, and

b) optionally an aromatic diamine selected from the group consisting of the aromatic diamines used as a chain extender which include but are not limited to methylene dianiline (MDA); 4,4'-methylene-bis-3-(chloro-2,6-diethylbenzenamine) (MCDEA); diethyltoluenedeamine (DETDA); 4,4'-methylene-bis-(2-ethyl-6-methylaniline) (MMEA); 4,4'-bis-(2,6-diethylaniline) (MDEA); 4,4'-methylene-bis-(2-isopropyl-6-methylaniline) (MMIPA); 4,4'-methylene-bis-(2-ethyl-6-methylcyclohexylamine) (M-MECA); 4,4'-bis(sec-butylamino), diphenylmethane; phenylenediamine; methylene-bis-orthochloroaniline (MBOCA); 4,4'-methylene-bis-(2-methylaniline) (MMA); 4,4'-methylene-bis-(2-chloro-6-ethylaniline) (MCEA); 4,4'-methylene-bis-(2,6-diethyl cyclohexylamine) (MDECA); 1,2-bis(2-aminophenylthio) ethane; N,N'-di-alkyl-p-phenylenediamine; 4,4'-bis(paraaminocyclohexyl) methane; 4,4'-methylene-bis(2,6-diisopropylaniline) (MDIPA); and dimethylthiotoluenediamine (DMTDA).

Part B—an isocyanate terminated polyurea prepolymer formed by mixing

a) a synthetic polymer of di-p-aminobenzoate containing a poly(tetramethyleneglycol (PTMEG) backbone with

b) a diisocyanate selected from the group consisting of 4,4'methylene diisocyanate (MDI); 2,4'-methylene diisocyanate; polymeric MDI; toluene diisocyanates; p- and m-phenylene diisocyanates; tetramethylene diisocyanate; 1,6-hexamethylene diisocyanate; 1,4-cyclohexylene diisocyanate; 4,4'-methylene dicyclohexyl diisocyanate; 4,4'-diphenylmethane diisocyanate; 1,5-naphthalene diisocyanate; carbodimide modified methylene diisocyanate; 1,5-tetrahydronapthalene diisocyanate; and mixtures of these.

5,183,878

EASILY PROCESSABLE, WHOLLY AROMATIC POLYESTER

Keiichi Kanaka; Noriyuki Hayashi; Toshihiro Kobashi; Yukihiko Kageyama, and Kenji Hijikata, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Sep. 20, 1991, Ser. No. 763,238

Claims priority, application Japan, Sep. 20, 1990, 2-251335

Int. Cl.[5] C08G *63/00, 63/18, 63/02*

U.S. Cl. 528—193 **11 Claims**

1. An easily processable wholly aromatic polyester consisting essentially of structural units represented by the formulas (i) to (iii) where:

(i) is $-\overset{O}{\overset{\|}{C}}-Ar_1-\overset{O}{\overset{\|}{C}}-$,

(ii) is $-\overset{O}{\overset{\|}{C}}-Ar_2-\overset{O}{\overset{\|}{C}}-$, and

(iii) is $-O-Ar_3-O-$,

and wherein Ar_1 is 1,4-phenylene; Ar_2 is a mixture of 2,6-naphthalene and 2,7-naphthalene wherein 2,6-naphthalene is present in a concentration of 10 to 90 mole percent based upon the total concentration of 2,6-naphthalene and 2,7-naphthalene; and Ar_3 is selected from the group consisting of 1,4-phenylene, 4,4'-biphenylene, and mixtures of these; and unit (ii) constitutes 10 to 90 mole percent of the units derived from a dicarboxylic acid present in said polyester.

5,183,879

POLYMER GEL MANUFACTURING METHODS

Satoshi Yuasa, Yokohama, and Yoshinori Tomida, Ebina, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1989, Ser. No. 423,893

Claims priority, application Japan, Oct. 21, 1988, 63-264027; Oct. 28, 1988, 63-270886; Feb. 17, 1989, 1-36320

Int. Cl.[5] C08F *6/04*

U.S. Cl. 528—503 **43 Claims**

1. A method of manufacturing a polymer gel comprising the steps of:

preparing a polymer gel by polymerizing monomers from which a polymer gel can be formed at temperature equal to or less than a phase transition temperature of the resultant polymer gel; and

separating the resultant polymer gel into fractional portions thereof at a temperature equal to or greater than the phase transition temperature of said polymer gel.

5,183,880

Patent Not Issued For This Number

5,183,881

O-AMINOAZO COMPOUNDS

Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

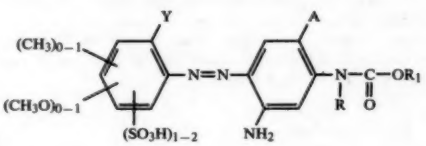
Filed Aug. 22, 1991, Ser. No. 748,604

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1990, 4027970

Int. Cl.[5] C09B *29/085, 43/124*

U.S. Cl. 534—732 **3 Claims**

1. A compound of the formula



in which

Y represents $-OCH_2$ or $-OC_2H_5$.

A represents hydrogen, Cl, —COOH, $-SO_3H$, $-CH_3$ or $-OCH_3$,

R represents hydrogen, $-CH_3$, $-C_2H_5$, $-C_2H_5OH$, $-CH_2CH_2COOH$ or $-CH_2CH_2SO_3H$, and

R_1 represents CH_3, $-C_2H_5$,n—C_3H_7, benzyl, phenyl or cyclohexyl.

5,183,882

2'-DEOXY-2'-METHYLIDENECYTIDINE DIHYDRATE, METHODS FOR ITS PRODUCTION AND COMPOSITIONS

Shinji Sakata; Takanori Miyashita, both of Choshi; Kazuhiko Kondo, Sapporo; Atsushi Sakai; Toshiyuki Shibata, both of Nakatsu, and Takayuki Ogawa, Chikujo, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka and Yamasa Shoyu Co., Ltd., Chiba, both of, Japan

Filed Feb. 19, 1991, Ser. No. 656,824

Claims priority, application Japan, Feb. 19, 1990, 2-37695

Int. Cl.[5] C04H *19/06;* **A61K** *31/70, 47/26*

U.S. Cl. 514—49 **8 Claims**

1. A composition which is obtained by liophylization of an aqueous solution containing 2'-deoxy-2'-methylidenecytidine dihydrate and saccharide(s).

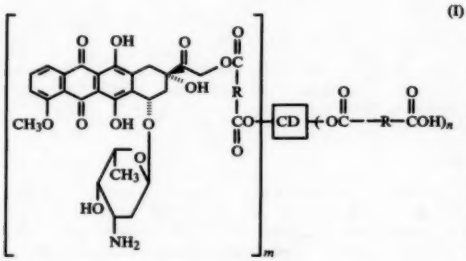
5,183,883

CONJUGATE OF ADRIAMYCIN AND CYCLODEXTRIN

Hiroshi Tanaka, Chigasaki; Kaichiro Kominato, Yamato; Takeo Yoshioka, Ayase; Hiroshi Iguchi, Yokohama; Shin-ichi Hirano, Chigasaki; Yasuo Okajima, Fujisawa; Reijko Yamamoto, Sagamihara; Masataka Shirai, Tokyo; Hiroshi Nishida, Yokosuka; Hiroshi Tone, Yokohama, and Rokuro Okamoto, Fujisawa, all of Japan, assignors to Mercian Corporation, Tokyo, Japan

Filed Sep. 27, 1991, Ser. No. 766,791
Claims priority, application Japan, Sep. 28, 1990, 2-257209
Int. Cl.[5] C07K *15/24*
U.S. Cl. 563—6.4 8 Claims

1. A compound of formula (I)



(I)

wherein

R is a divalent hydrocarbon group selected from the group consisting of C_1–C_6 alkylene, —C≡C—, C_5–C_7 cycloalkylene, 1,2-phenylene and 2,3- and 1,8-naphthalene,

CD is a cyclodextrin residue,

m is 1 to 8, and

n is 0 to 8.

5,183,884

DNA SEGMENT ENCODING A GENE FOR A RECEPTOR RELATED TO THE EPIDERMAL GROWTH FACTOR RECEPTOR

Matthias H. Kraus, Bethesda, Md., and Stuart A. Aaronson, Vienna, Va., assignors to United States of America, Washington, D.C.

Filed Dec. 1, 1989, Ser. No. 444,406
Int. Cl.[5] C07H *15/12*; C12N *1/20, 15/00*
U.S. Cl. 536—23.5 8 Claims

1. A DNA isolate consisting essentially of the nucleotide sequence of an erbB-3 gene defined in FIG. 4.

5,183,885

METHOD FOR CHROMATOGRAPHIC SEPARATION OF SYNTHETIC PHOSPHOROTHIOATE OLIGONUCLEOTIDES

B. John Bergot, Redwood City, Calif., assignor to Applied Biosystems, Inc., Foster City, Calif.

Filed Oct. 18, 1991, Ser. No. 779,012
Int. Cl.[5] C07B *63/00*; C07H *21/04, 1/06*
U.S. Cl. 536—25.41 6 Claims

1. A method of separating completely sulfurized phosphorothioate or phosphorodithioate oligonucleotides from a mixture of completely sulfurized and incompletely sulfurized phosphorothioate or phosphorodithioate oligonucleotides, the method comprising the steps of:

(a) impregnating a strong anion exchanger with the mixture of completely sulfurized and incompletely sulfurized phosphorothioate or phosphorodithioate oligonucleotides, the strong anion exchanger consisting of a mechanically rigid styrene-divinylbenzene matrix derivatized with a quaternary alkylammonium cation;

(b) passing through the strong anion exchanger a buffer solution comprising a a soft-base counter ion at a concentration which monotonically increases with time to a sample-desorbing concentration, the soft-base counter ion being selected from the group consisting of bromide, thiocyanate, azide, iodide, and sulfide; and

(d) recovering the eluate from step (b).

5,183,886

PROCESS FOR PREPARATION OF CRYSTALLINE OXYTITANIUM PHTHALOCYANINE SHOWING A,B OR C FORM

Iwao Takagishi, Yokohama, Japan, assignor to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 526,585, May 21, 1990, abandoned.
This application May 22, 1992, Ser. No. 888,246
Claims priority, application Japan, May 22, 1989, 1-128426; Jul. 18, 1989, 1-185075; Jul. 27, 1989, 1-194815
Int. Cl.[5] C09B *67/50*
U.S. Cl. 540—141 14 Claims

1. A process for the preparation of crystalline oxytitanium phthalocyanine showing A, B or C crystalline form consisting of contacting dichlorotitanium phthalocyanine, dibromotitanium phthalocyanine or a mixture of them with at least one organic solvent selected from the group consisting of aromatic nitro compounds, nitrogen-containing cyclic ethers, aromatic amines, alcohols containing not less than 4 carbon atoms, aldehydes, ketones, lactones, lactams, acid amides, nitriles, alkyl sulfoxides and substituted phenols to produce the crystalline oxytitanium phthalocyanine.

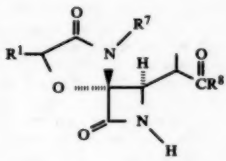
5,183,887

SPIROCYCLIC 6-AMIDO-CARBAPENEMS AND AZETIDINONES

Mark L. Greenlee, Rahway; Thomas N. Salzmann, No. Plainfield, and Frank P. DiNinno, Old Bridge, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 576,087, Aug. 30, 1990, Pat. No. 5,055,463.
This application Jul. 9, 1991, Ser. No. 727,192
Int. Cl.[5] C07D *498/1, 498/2*
U.S. Cl. 540—364 11 Claims

1. A compound of the structural formula:



wherein R^1 is hydrogen, C_{1-8} alkyl or C_{6-10} aryl; R^7 is hydrogen or a protecting group for amido nitrogen; and R^8 is hydroxy, hydrogen, C_{1-8} alkylthio cyano-C_2alkylthio, C_{6-10} arylthio, or 2-pyridylthio.

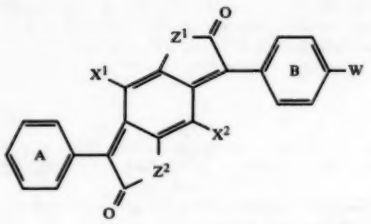
5,183,888

POLYCYCLIC DYES

Ronald W. Kenyon, Manchester; David F. Newton, Oldham, and Derek Thorp, Heywood, all of England, assignors to Imperial Chemical Industries PLC, London, England

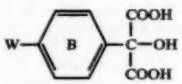
Division of Ser. No. 410,630, Sep. 21, 1989, Pat. No. 5,084,580.
This application Nov. 9, 1990, Ser. No. 611,288
Claims priority, application United Kingdom, Oct. 3, 1988, 8823158
Int. Cl.[5] C07D *493/04*
U.S. Cl. 544—153 1 Claim

1. A process for the preparation of a polycyclic dye of Formula I:



I

by reacting a phenyltartronic acid of Formula II:



II

wherein:

W is $—NR^1R^2$ or $—OR^3$;

R^3 is H or C_{1-20}-alkyl, C_{2-20}-alkenyl, C_{4-8}-cycloalkyl or phenyl-C_{1-4}-alkylene group each of which is unsubstituted or is substituted by a group selected from alkyl, alkoxy, nitro, halogen, alkoxyalkoxy, cyclohexyl, phenyl, diphenyl, hydroxy, alkylcarbonyl, alkoxycarbonyl, alkoxyalkoxy carbonyl, alkoxycarbonyloxy, alkoxyalkoxycarbonyloxy, alkylcarbonyloxy, cyano and amino in which each alkyl is C_{1-4}-alkyl;

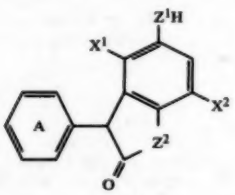
R^1 & R^2 are each independently H or C_{1-20}-alkyl, C_{2-20}-alkenyl, C_{4-8}-cycloalkyl, phenyl-C_{1-4}-alkylene or phenyl group each of which is unsubstituted or is substituted by a group selected from alkyl, alkoxy, nitro halogen, alkoxyalkoxy, cyclohexyl, phenyl, diphenyl, hydroxy, alkylcarbonyl, alkoxycarbonyl, alkoxyalkoxycarbonyl, alkoxycarbonyloxy, alkoxyalkoxycarbonyloxy, alkylcarbonyloxy, cyano and amino in which each alkyl is C_{1-4}-alkyl; or

R^1 & R^2 together with the nitrogen atom to which they are attached from a piperidino or morpholino group; or

R^1 or R^2 together with the nitrogen atom and the adjacent carbon atom of Ring B form a tetrahydroquinolinyl group; and

Ring B is unsubstituted, apart from the group W, or is substituted by from one or two further groups selected from alkyl; alkenyl; alkoxy; alkoxyalkoxy; alkoxycarbonylalkoxy; alkoxyalkoxycarbonyl alkoxy; alkylcarbonyloxyalkoxy; cyanoalkoxy; hydroxyalkoxy; chlorine; bromine; hydroxy; alkylthio; arylthio; aryloxy; alkylsulphonyl; in which the alkyl or alkenyl contains up to 4 carbon atoms and the aryl is phenyl;

with either (a) a compound of Formula III:



III

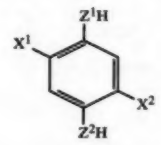
wherein,

Z^1 & Z^2 are each —O—;

X^1 & X^2 are each independently selected from H, halogen, cyano, alkyl, aryl, carbamoyl, sulphamoyl, COOH and carboxylic acid ester; &

Ring A is unsubstituted or is substituted by from one to three groups selected from alkyl; alkenyl; alkoxy; alkoxyalkoxy; alkoxycarbonylalkoxy; alkoxyalkoxycarbonylalkoxy; alkylcarbonyloxyalkoxy; cyanoalkoxy; hydroxyalkoxy; chlorine; bromine; hydroxy; akylthio; arylthio; aryloxy; alkylcarbonyl and alkylsulphonyl; in which the alkyl or alkenyl contains up to 4 carbon atoms and the aryl is phenyl; $NHCOC_{1-4}$-alkyl; $—NHSO_2C_{1-4}$-alkyl; NR^1R^2 and OR^3, wherein R^1, R^2 and R^3 are as hereinbefore defined;

or (b) a compound of Formula IV:



IV

wherein Z^1, Z^2, X^1 and X^2 are as hereinbefore defined; and oxidation of the intermediate compound to dehydrogenate the peripheral heterocyclic rings.

5,183,889

BENZONAPHTAHALENE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN THERAPEUTIC AND COSMETIC COMPOSITIONS

Braham Shroot, Antibes; Jacques Eustache, Grasse, and Jean-Michel Bernardon, Nice, all of France, assignors to Centre International de Recherches Dermatologiques (CIRD), Valbonne, France

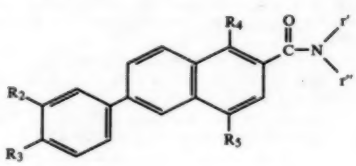
Division of Ser. No. 502,122, Mar. 30, 1990, Pat. No. 5,098,895, which is a division of Ser. No. 120,958, Nov. 16, 1987, Pat. No. 4,940,696, which is a division of Ser. No. 850,145, Apr. 10, 1986, Pat. No. 4,717,720. This application Dec. 9, 1991, Ser. No. 803,965

Claims priority, application Luxembourg, Apr. 11, 1985, 85849

Int. Cl.[5] C07D *265/30, 265/32;* **C07F** *7/02*

U.S. Cl. 544—174 **12 Claims**

1. A benzonaphthalene compound of the formula:



wherein

r′ and r″ taken together form a heterocycle selected from the group consisting of piperidino, piperazino, morpholino and pyrrolidino,

R_2 represents hydrogen, branched or straight chain alkyl having 1–15 carbon atoms, alkoxy having 1–4 carbon atoms or a cycloaliphatic radical,

R_3 represents hydrogen, hydroxy, branched or straight chain alkyl, alkoxy having 1–10 carbon atoms, a cycloaliphatic radical selected from the group consisting of 1-methyl cyclohexyl and 1-adamantyl, a thiocycloaliphatic radical or $—O—Si(CH_3)_2—R_8$ wherein R_8 represents linear or branched lower alkyl,

R_4 and R_5, each independently, represent hydrogen, lower alkyl, hydroxy or lower acyloxy,

or a salt thereof.

5,183,890

Patent Not Issued For This Number

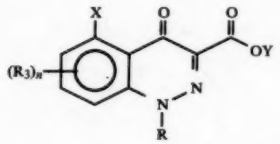
5,183,891

METHOD FOR THE PREPARATION OF SUBSTITUTED 1,4-DIHYDRO-4-OXO-CINNOLINE-3-CARBOXYLIC ACID, ESTERS AND SALTS THEREOF, AND INTERMEDIATES USED IN THEIR PREPARATION

Jeffrey Labovitz, Palo Alto; William J. Guilford, San Leandro; Lawrence Fang, Foster City, and Yi Liang, San Jose, all of Calif., assignors to Orsan and Orsem, both of Paris, France

Filed Nov. 9, 1989, Ser. No. 434,077
Int. Cl.[5] C07D *237/28*
U.S. Cl. 544—235 19 Claims

1. A method for the preparation of a substituted cinnoline of the formula:



(I)

wherein X represents formula OR_1 or NR_1R_2, wherein R_1represents C_1–C_4 alkyl optionally substituted with C_1–C_4 alkoxy, 1 to 3 halogen atoms, or carboxy or C_1–C_4 alkoxycarbonyl; a C_2–C_4 alkenyl optionally substituted with 1 to 3 halogen atoms; or C_2–C_4 alkynyl; and R_2 independently represent H or alkyl;

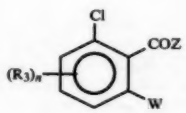
Y is H or C_1–C_{22} linear alkyl or alkenyl having up to four carbon-carbon double bonds, C_3–C_6 branched alkyl or alkenyl, C_1–C_4 alkoxyalkyl, cyclohexylmethyl, halogenated C_1–C_4 alkyl, phenyl, benzyl, $-(CH_2CH_2O)_mCH_2CH_3$ in which m is an integer from 1 to 5, or $-(CH_2OR_4)CH_2OR_5$ or $-CH_2CHOR_4CH_2OR_5$ in which either R_4 or R_5 but not both represent a C_1–C_{22} linear alkyl- or alkenylcarbonyl having up to four carbon-carbon double bonds and the other of R_4 or R_5 is H;

R is C_1–C_4 alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted with one to three substituents selected from the group consisting of halogen, $CONH_2$, C_1–C_4 alkyl or haloalkyl, C_1–C_4 alkoxy or haloalkoxy, and cyano;

each R_3 independently represents H or C_1–C_4 alkyl, or haloalkyl, C_1–C_4 alkoxy or haloalkoxy, C_1–C_4 alkanoyl, cyano, nitro, hydroxy or halo; and

n is an integer from 0 to 3; which comprises:

reacting a compound of the formula



(IV)

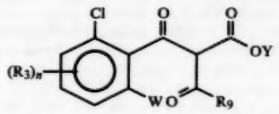
wherein R_3 and n have the previously defined meanings;

W is either F or Cl; and

Z is a leaving group selected from the group consisting of H, halogen, ester, and amide leaving groups;

(V)

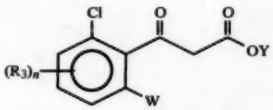
wherein R_9 is a hydrocarbon and Y has the previously defined meanings to form a trione of the formula



(VI)

wherein Y, W, R_3, R and n have the meanings as previously defined,

(1) converting said trione to a dione by heating in an organic solvent, said dione compound having the formula

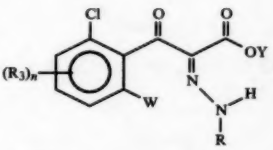


(VII)

wherein Y, W, R_3, and n have the meanings as previously defined,

and reacting said dione with a diazonium salt of the formula $RN^+{}_2A^-$

wherein R has the meanings as previously defined and A^- is any counter ion, to form a hydrazone of the formula

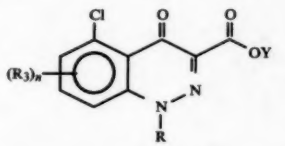


(VIII)

wherein Y, W, R_3, R, and n have the meanings as previously defined,

or (2) converting said trione directly to the hydrazone of formula VIII by reacting said trione with said diazonium salt of the formula $RN^+{}_2A^-$, wherein R and A have the meanings as previously defined;

causing said hydrazone to undergo a self-condensation reaction to produce a cinnoline precursor compound of the formula



(IX)

wherein Y, R_3, R, and n have the meanings as previously defined,

and reacting said cinnoline precursor compound with

(1) a compound of the formula

R_1OH or $R_1O^-M^+$

wherein M^+ is a metal cation and R_1 has the meanings as previously defined, or

(2) a compound of the formula

NHR_1R_2

wherein R_1 and R_2 have the meanings as previously defined to form the desired compound of formula I.

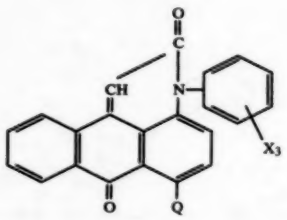
5,183,892

ANTHRAPYRIDONE COMPOUNDS

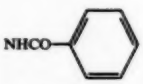
Toshio Nakamatsu, Osaka; Masanobu Terao, Hyogo; Shigetoshi Muneishi, Hyogo; Norio Kometani, Hyogo, and Yoshiaki Hayashi, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Daili Chemical Company, Limited, Hyogo, both of, Japan

Continuation-in-part of Ser. No. 384,769, Jul. 25, 1989, abandoned. This application Nov. 30, 1990, Ser. No. 621,236
Claims priority, application Japan, Jul. 29, 1988, 63-191918
Int. Cl.[5] C07D *221/18*
U.S. Cl. 546—76 **11 Claims**

1. An anthrapyridone compound represented by the following formula:



wherein Q is NH_2, $NHCH_3$, or



and X_3 is —$NHCOR^1$ or —$SO_2NR^7R^8$ wherein R^1, R^7 and R^8 are each C_{1-4} alkyl.

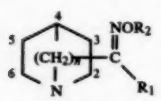
5,183,893

1-AZABICYCLOALKANE DERIVATIVES, THEIR PREPARATION PROCESS AND THEIR USE AS MEDICAMENTS

Giulio Galliani; Fernando Barzaghi, both of Monza; Carla Bonetti, Fontanella, and Emilio Toja, Milan, all of Italy, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 426,778, Oct. 26, 1989, Pat. No. 5,015,665. This application Mar. 26, 1991, Ser. No. 664,120
Claims priority, application Italy, Oct. 28, 1988, 22452 A/88
Int. Cl.[5] C07D *471/08*
U.S. Cl. 546—133 **15 Claims**

1. A compound of formula I



(I)

in which

n represents the number 2, and

R_1 and R_2, identical or different, represent hydrogen or an unsubstituted or substituted member of the group consisting of a linear, branched or cyclic alkyl, alkenyl and alkynyl which contain up to 6 carbon atoms in which the member, if substituted, is substituted by at least one of hydroxy, alkoxy containing up to 6 carbon atoms, benzyl, phenethyl, a $COOalk_1$ radical in which alk_1 represents alkyl containing up to 6 carbon atoms, and a —$CON(alk_2)_2$ radical in which alk_2 represents alkyl containing up to 6 carbon atoms, the radical —$C(R_1)$=NOR_2 being in the 2, 3 or 4 position, in all its isomer forms or a pharmaceutically acceptable addition salt thereof with an organic or mineral acid.

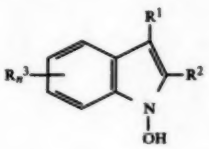
5,183,894

2-SUBSTITUTED-1-HYDROXYINDOLES

William R. Schleigh, Brockport, and Thomas R. Welter, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 562,997, Aug. 6, 1990, abandoned. This application Jul. 1, 1991, Ser. No. 724,232
Int. Cl.[5] C07D *209/42, 209/30, 213/50*; A01N *43/40*
U.S. Cl. 546—273 **10 Claims**

1. A compound having the following formula:



wherein,

R^1 is carbamoyl, t-butylcarbamoyl, dimethylcarbamoyl, carboxy, nitro or cyano;

R^2 is an alkenyl having 2–10 carbon atoms, and an N-substituted α-iminobenzyl group wherein the substituents are selected from the group consisting of phenyl, anilino and dimethylamino, or an aromatic group selected from the group consisting of phenyl, 4-nitrophenyl, 3-nitrophenyl, 3-trifluoromethylphenyl, 4-fluorophenyl, 4-formylphenyl, 4-carbamoylphenyl and 4-hydroxyiminomethylphenyl;

R^3 is a halogen atom; and

n is 0,1 or 2

provided that when R^2 is either phenyl or nitro substituted phenyl and n is 0, then R^1 is not cyano.

5,183,895

4-(N-BENZYL-N-METHYLAMINO)PYRIDINE ACID SALTS AND USE IN PREPARATION OF POLYMER-SUPPORTED CATALYSTS

Donald W. McQuigg; Edward E. Sowers, both of Mooresville; Gerald L. Goe; Eric F. V. Scriven, both of Greenwood, and James G. Keay, Indianapolis, all of Ind., assignors to Reilly Industries, Inc., Indianapolis, Ind.

Division of Ser. No. 690,393, Nov. 5, 1990, which is a continuation-in-part of Ser. No. 247,152, Sep. 21, 1988, Pat. No. 5,015,706. This application Feb. 18, 1992, Ser. No. 836,257
Int. Cl.[5] C07D *211/72*
U.S. Cl. 546—304 **14 Claims**

1. In preparing a vinyl-substituted 4-(N-benzyl-N-methylamino)pyridine monomer for use in a polymerization, the improvement comprising the steps of isolating and purifying the crude monomer once formed with an acid sufficiently strong to form a salt with said monomer for stable storage pending later use.

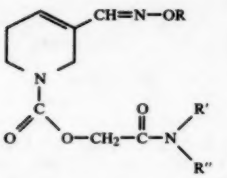
5,183,896

NEW DERIVATIVES OF 1,2,5,6-TETRAHYDROPYRIDIN-3-CARBOXALDEHYDE OXIME

Emilio Toja, Milan; Carla Bonetti, Fontanella; Fernando Barzaghi, and Giulio Galliani, both of Monza, all of Italy, assignors to Roussel Uclaf, Paris, France

Filed Mar. 11, 1991, Ser. No. 666,515
Claims priority, application Italy, Mar. 14, 1990, 19675 A/90
Int. Cl.[5] C07D *211/68*
U.S. Cl. 546—326 **11 Claims**

1. A compound of formula I



in which: R represents hydrogen, a linear, branched or cyclic alkyl, alkenyl or alkynyl containing up to 8 carbon atoms, and R′ and R″ are identical or different from each other, and represent a hydrogen, a linear, branched or cyclic alkyl, alkenyl or alkynyl containing up to 8 carbon atoms, or form together with the nitrogen to which they are linked a heterocyclic radical selected from the group consisting of piperidinyl, piperazinyl, N-methyl piperazinyl and morpholinyl, said morpholinyl being optionally substituted by an alkyl radical containing up to 4 carbon atoms.

5,183,897

CERTAIN INTERMEDIATE IMINO-SUBSTITUTED PYRIDINES

Rolf Angerbauer; Peter Fey; Walter Hübsch, all of Wuppertal; Thomas Philipps, Cologne; Hilmar Bischoff, Wuppertal; Dieter Petzinna, Duesseldorf, and Delf Schmidt, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengellschaft, Leverkusen, Fed. Rep. of Germany

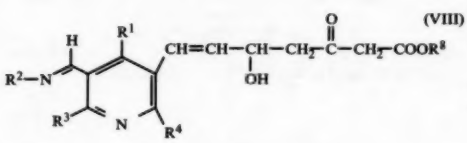
Division of Ser. No. 558,029, Jul. 26, 1990, Pat. No. 5,064,841. This application Apr. 18, 1991, Ser. No. 687,272

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 3925636

Int. Cl.[5] C07D *213/53, 213/54, 213/55, 213/57*

U.S. Cl. 546—330 **2 Claims**

1. A ketone of the formula



(VIII)

in which

R^1 represents aryl having 6 to 10 carbon atoms, which is optionally monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, hydroxyl, trifluoromethyl, trifluoromethoxy, nitro, cyano, straight-chain or branched alkyl or alkoxy in each case having up to 8 carbon atoms and aryloxy having 6 to 10 carbon atoms,

R^2 represents aryl having 6 to 10 carbon atoms, which is optionally monosubstituted to trisubstituted by identical or different substituents from the group consisting of straight-chain or branched alkyl in each case having up to 8 carbon atoms, halogen, cyano, trifluoromethyl, trifluoromethoxy and nitro, or represents straight-chain or branched alkyl having up to 10 carbon atoms, which is optionally substituted by aryl having 6 to 10 carbon atoms, hydroxyl or alkoxy having up to 8 carbon atoms, or represents a group of the formula —OR^5, in which

R^5 denotes hydrogen or straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally substituted by aryl having 6 to 10 carbon atoms, or denotes aryl having 6 to 10 carbon atoms, which is optionally substituted by straight-chain or branched alkyl or alkoxy in each case having up to 8 carbon atoms, halogen, nitro, cyano, trifluoromethyl or trifluoromethoxy,

R^3 and R^4 are each isopropyl and R^8 represents alkyl.

5,183,898

PESTICIDAL NITRO-SUBSTITUTED BENZOTHIAZOLONES

Klaus Wagner, Cologne; Gerd Hänssler, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

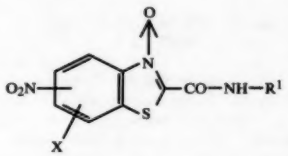
Division of Ser. No. 504,150, Apr. 2, 1990, Pat. No. 5,093,345. This application Nov. 15, 1991, Ser. No. 792,850

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911227

Int. Cl.[5] C07D *277/68*

U.S. Cl. 548—178 **1 Claim**

1. A nitro-substituted benzothiazole-3-oxide of the formula



(IV)

in which

X represents hydrogen, halogen, alkyl or halogenoalkyl and

R^1 represents alkyl which is monosubstituted or disubstituted by identical or different substituents from the group consisting of cyano, carboxyl and alkoxycarbonyl.

5,183,899

PYRAZOLE DERIVATIVE

Takehiko Naka, Kobe, and Kohei Nishikawa, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jul. 31, 1990, Ser. No. 560,759

Claims priority, application Japan, Aug. 2, 1989, 1-200963; Sep. 11, 1989, 1-235124; Nov. 10, 1989, 1-293459

Int. Cl.[5] C07D *403/10;* **A61K** *31/415*

U.S. Cl. 548—253 **1 Claim**

1. A compound which is 5-butyl-N-(2-methoxyethyl)-1-[[2′-(1H)-tetrazol-5-yl)biphenyl-4-yl]methyl]pyrazole-3-carboxamide.

5,183,900

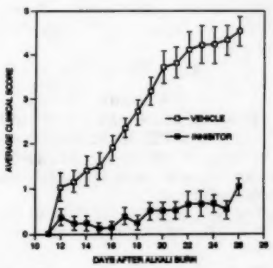
MATRIX METALLOPROTEASE INHIBITORS

Richard E. Galardy, 73 Faulkner Dr., Guilford, Conn. 06437, and Damian Grobelny, 43 Brassey Avenue, Rosanna, Victoria 3084, Australia

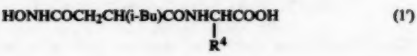
Filed Nov. 21, 1990, Ser. No. 615,798

Int. Cl.[5] C07D *401/06, 209/22*

U.S. Cl. 548—495 **4 Claims**



1. A compound of the formula



wherein R^4 is 3-indolyl methylene, and the pharmaceutically acceptable amides thereof.

5,183,901

UREA-HYDROGEN PEROXIDE-POLYVINYLPYRROLIDONE

Robert B. Login, Oakland; John J. Merianos, Middletown; Russell B. Biss, Paramus, and Paul Garelick, South Plainfield, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Jan. 24, 1992, Ser. No. 825,359

Int. Cl.[5] C01B *15/01*

U.S. Cl. 548—543 **13 Claims**

1. A process for the production of free-flowing powders of a urea-H_2O_2-PVP product comprising reacting a fluidized bed of PVP maintained at a reaction temperature of from ambient temperature to about 60° C. with finely divided droplets of a 15 to 30% by weight aqueous solution of urea-H_2O_2, and drying the product.

5,183,902

METHOD OF TREATING MUSCULAR TENSION, MUSCLE SPASTICITY AND ANXIETY WITH 3-ARYLOXY AND 3-ARYLTHIOAZETIDINECARBOXAMIDES

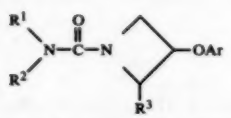
Chandler R. Taylor, Jr.; Albert D. Cale, Jr., both of Mechanicsville, and Harold F. Stauffer, Jr., Midlothian, all of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 921,521, Oct. 22, 1986, Pat. No. 5,068,231, and a continuation-in-part of Ser. No. 706,632, Feb. 28, 1985, abandoned. This application Aug. 9, 1991, Ser. No. 743,059

Int. Cl.[5] C07D *205/04*

U.S. Cl. 548—950 **10 Claims**

1. A 3-aryloxyazetidinecarboxamide compound selected from the group having the formula:



wherein:

Ar is phenyl or phenyl substituted by chloro, bromo, iodo, fluoro, loweralkyl, loweralkoxy, nitro, aminocarbonyl or trifluoromethyl;

R^3 is H or loweralkyl;

R^1 is C_3–C_9 cycloalkyl, allyl, 2-methyl-2-propenyl, propargyl, phenyl or phenyl substituted by halogen, loweralkyl, loweralkoxy, nitro, cyano, or trifluoromethyl; and

R^2 is H.

5,183,903

UREA FUSION PROCESS FOR THE SYNTHESIS OF 3-PHENOXY-1-AZETIDINECARBOXAMIDES

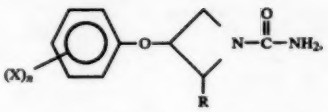
William J. Welstead, Jr., Richmond, Va., and Young S. Lo, Hockessin, Del., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Nov. 26, 1991, Ser. No. 798,674

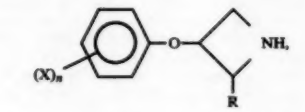
Int. Cl.[5] C07D *205/04*

U.S. Cl. 548—952 **11 Claims**

1. A process for the preparation of compound having the formula:



wherein n is 1 to 3, R is H or methyl, and X is hydrogen, halogen, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, acetyl or aminocarbonyl and when n is 2 or 3, the values of X may be the same or different, which comprises heating together a compound having the formula:



wherein n, X and R are as defined above, with from about 1 to about 10 molar equivalents of urea at from about 60° C. to about 150° C. for from 0.5 to 5 hours in the absence of a solvent.

5,183,904

HINDERED LINKING AGENTS AND METHODS

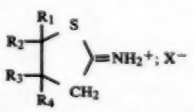
Stephen F. Carroll, Walnut Creek, Calif., and Dane A. Goff, Menlo Park, both of Calif., assignors to Xoma Corporation, Berkeley, Calif.

Division of Ser. No. 454,576, Dec. 21, 1989, Pat. No. 5,093,475, which is a continuation-in-part of Ser. No. 288,586, Dec. 22, 1988, abandoned. This application Nov. 20, 1991, Ser. No. 796,048

Int. Cl.[5] C07D *333/36*

U.S. Cl. 549—68 **6 Claims**

1. A compound of the following formula (I):



(I)

wherein,

X is halogen;

R_1 is $COOR_5$; halogen; nitro; halogenated C_{1-3}alkyl; unsubstituted C_{1-3}alkoxy; halogenated C_{1-3}alkoxy; unsubstituted C_{2-3}alkenyl; halogenated C_{2-3}alkenyl; unsubstituted C_{2-3}alkynyl; halogenated C_{2-3}alkynyl; unsubstituted C_{3-8}cycloalkyl; unsubstituted aryl; aryl substituted with 1 to 3 substituents selected from halogen, amino, unsubstituted or halogenated C_{1-3}alkyl, or unsubstituted or halogenated C_{1-3}alkoxy; unsubstituted heterocycle; or heterocycle substituted with 1 to 3 substituents selected from halogen, amino, unsubstituted or halogenated C_{1-3}alkyl, or unsubstituted or halogenated C_{1-3}alkoxy:

each of R_2, R_3 and R_4 is independently hydrogen or selected from the values of R_1; or

R_1 and R_2 together form a C_{2-5}alkylene bridge, unsubstituted or substituted with one to five C_{1-4}alkyl groups; or

R_1 or R_2 together with R_3 form a C_{1-5}alkylene bridge, unsubstituted or substituted with one to five C_{1-4}alkyl groups; and

R_5 is hydrogen or C_{1-3}alkyl.

5,183,905
PHENOLPHTHALEIN BIS (DIHYDROCARBYL PHOSPHATE) COMPOUNDS

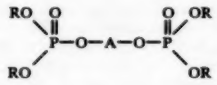
Alan M. Aaronson, Flushing Meadows, and Danielle A. Bright, Spring Valley, both of N.Y., assignors to Akzo NV, Arnhem, Netherlands

Continuation of Ser. No. 660,452, Feb. 25, 1991, abandoned. This application Apr. 20, 1992, Ser. No. 870,748

Int. Cl.[5] C07F *9/06*; C09K *21/00*

U.S. Cl. 549—218 **8 Claims**

1. A phenolphthalein bis(dihydrocarbyl phosphate) compound of the formula



where R is selected from the group consisting of C_1–C_{20} alkyl, cycloalkyl, C_2–C_{12} alkenyl, and phenyl and —O—A—O— is a phenolphthalein moiety minus its hydroxy hydrogen atoms.

5,183,906
2- AND 5-ALKYL AND PHENYL SUBSTITUTED 4-(1-HYDROXY, 1-ACYLOXY OR 1-CARBAMOYLOXY)-5-HYDROXY-2 (5H)-FURANONES AS ANTI-INFLAMMATORY AGENTS

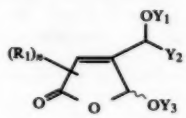
Gary C. M. Lee, Laguna Hills; Michael E. Garst, Newport Beach, and George Sachs, Encino, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Apr. 30, 1991, Ser. No. 693,204

Int. Cl.[5] C07F *9/09*; C07D *307/34*

U.S. Cl. 549—218 **28 Claims**

1. A compound of the formula



where:

R_1 independently is H, phenyl, C_1–C_6 alkyl substituted phenyl, halogen substituted phenyl, or alkyl of 1 to 6 carbons and n is an integer having the values of 1 or 2, and where when n is 1 the R_1 group is attached to one of the 3 and the 5 positions of the 2-furanone, when n is 2 then the R_1 groups are attached to both the 3 and 5 positions with the proviso that when n is 1 then R_1 is not H;

Y_1 is H, alkyl of 1 to 20 carbons, phenyl C_1–C_{20} alkyl, C_1–C_{20} alkenyl containing one or more olephinic bonds, $PO(OH)_2$, $PO(OH)OR_2$, $PO(OH)R_2$, $PO(OR_2)_2$, where R_2 is independently alkyl of 1 to 20 carbons, phenyl, or halogen substituted phenyl or C_1–C_6 alkyl substituted phenyl, further Y_1 is CO—R_3, CO—OR_3, $CONHR_3$, SO_2R_3, $(CH_2)_p$—O—R_3, or $(CH_2)_p$—O—$(CH_2)_m$—O—R_3, where p, and m, are integers and are independently 1 to 20 and R_3 is H, C_1–C_{20} alkyl, C_1–C_{20} alkenyl containing one or more olefinic bonds, phenyl, halogen substituted phenyl or C_1–C_6 alkyl substituted phenyl, with the proviso that when Y_1 is CO—OR_3, or $CONHR_3$ then R_3 is not hydrogen;

Y_2 is H, an alkyl group of 6 to 25 carbons, phenyl, naphthyl, phenyl (C_1–C_{20})alkyl—, naphthyl (C_1–C_{20})alkyl—, C_1–C_6 alkyl substituted phenyl, halogen substituted naphthyl, C_1–C_6 substituted naphthyl, and

Y_3 is H, alkyl of 1 to 20 carbons, CO—R_4, CO—O—R_4, CO—NH—R_4, $PO(OR_4)_2$or $PO(OR_4)R_4$, where R_4 independently is H, alkyl of 1 to 20 carbons, phenyl, halogen substituted phenyl or C_1–C_6 alkyl substituted phenyl, with the proviso that when $Y_3$is $COOR_4$ or $CONHR_4$ then R_4 is not H, or a pharmaceutically acceptable salt thereof.

5,183,907
PROCESS FOR PREPARING DIPHENYL ETHERS

Stuart P. Briggs, Faversham, England, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

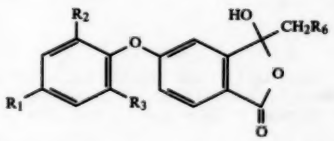
Continuation of Ser. No. 241,196, Sep. 7, 1988, abandoned. This application Oct. 29, 1991, Ser. No. 784,743

Claims priority, application United Kingdom, Sep. 30, 1987, 8722968

Int. Cl.[5] C07D *307/88*

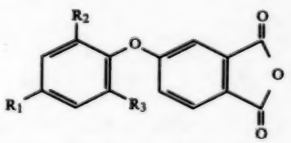
U.S. Cl. 549—310 **9 Claims**

1. A process for the preparation of a diphenyl ether derivative of Formula II



(II)

wherein R_1 represents a hydrogen or halogen atom or an alkyl or haloalkyl group, R_2 and R_3, which may be the same or different, each independently represents a hydrogen or halogen atom, or an alkyl, haloalkl, nitro or cyano group, and R_6 represents a hydrogen atom or an alkyl group, said process comprising treating a compound of formula III



(III)

where R_1, R_2 and R_3 are as defined above with a dicarboxylic acid of formula R_6—$CH(COOH)_2$, where R_6 is as defined above, in the presence of an organic base, to obtain a reaction mixture containing product of formula II as the major product, and separating the product of the formula II from the reaction mixture.

5,183,908
PROCESS FOR THE PREPARATION OF SUBSTITUTED FURANONES

A. Frederick Elsasser, and Thomas J. Korte, both of Cincinnati, Ohio, assignors to Henkel Corporation, Ambler, Pa.

Continuation of Ser. No. 191,443, May 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 944,149, Dec. 19, 1986, abandoned. This application Feb. 27, 1990, Ser. No. 485,821

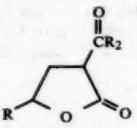
Int. Cl.[5] C07D *307/20*

U.S. Cl. 549—322 **4 Claims**

1. A process for preparing substituted furanones which comprises combining a 1,2-epoxyalkane containing from 3 to 6 carbon atoms, a beta-ketoester of the formula

where R_2 is a C_{1-4} alkyl group and X is a C_{4-10} alkoxy group, and water; adding aqueous sodium hydroxide or potassium hydroxide with agitation at a rate such that the temperature of the reaction mixture does not exceed 40° C., said reaction mixture containing 20% to 60% water and 2% to 4% molar excess of the base based on the beta-ketoester, with the molar

ratio of the 1,2-epoxyalkane to beta-ketoester ranging from 1:1.1 to 1:1.7; maintaining the temperature of the mixture from 20° C. to 35° C. until the reaction is essentially complete; adding mineral acid to adjust the pH to between 4 and 7; separating the organic phase from the aqueous phase; and recovering a substituted furanone product of the formula



wherein R is a C_{1-4} alkyl group and R_2 is the same as defined above from the organic phase.

5,183,909

MONO ESTER OF DICARBOXYLIC ACID

Mitsuaki Ohtani, Nara, and Takaharu Matsuura, Hyogo, both of Japan, assignors to Shionogi & Company, Ltd., Osaka, Japan

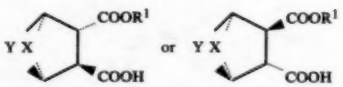
Division of Ser. No. 448,867, Dec. 12, 1989, Pat. No. 5,047,574. This application Jun. 20, 1991, Ser. No. 718,365

Claims priority, application Japan, Dec. 14, 1988, 63-315729

Int. Cl.[5] C07D *307/00*

U.S. Cl. 549—463 **1 Claim**

1. An optically active mono-ester of a dicarboxylic acid of the formulas:



wherein X is —O—; Y is $—(CH_2)_2—$; R^1 is alkyl which may be substituted by alkoxy, halogen, amino, amino derivative, or nitro or R^1 is alkenyl, aryl, or aralkyl, each of which may be substituted by alkyl, alkoxy, halogen, amino, amino derivative, or nitro or the enantiomer of said carboxylic acid esters of the aforementioned formulas.

5,183,910

PROCESS AND INTERMEDIATES FOR CHIRAL EPOXIDES

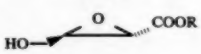
Leland O. Weigel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 518,384, May 3, 1990, Pat. No. 5,097,049. This application Oct. 3, 1991, Ser. No. 770,676

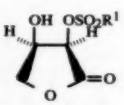
Int. Cl.[5] C07D *301/02*

U.S. Cl. 549—539 **5 Claims**

1. A method for preparing a compound of the formula



which method comprises reacting a γ-lactone of the formula



under substantially anhydrous conditions with at least one equivalent of an alkoxide of the formula RO^- in the presence of an alcohol of the formula ROH wherein R is the hydrocarbon residue of a C_1–C_8 alcohol and R^1 is C_1–C_6 alkyl, trifluoromethyl, benzyl, phenyl, tolyl or trimethylphenyl.

5,183,911

PROCESS FOR THE PRODUCTION OF STABLE OZONIZED OILS FROM UNSATURATED VEGETABLE OILS

Josef Washüttl, Wien, Austria, and Renate Viebahn, Iffezheim, Fed. Rep. of Germany, assignors to Dr. J. Hansler GmbH, Iffezheim, Fed. Rep. of Germany

Continuation of Ser. No. 626,244, Dec. 12, 1990, abandoned, which is a continuation of Ser. No. 20,711, Mar. 2, 1987, abandoned. This application Apr. 6, 1992, Ser. No. 866,251

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1986, 3606735

Int. Cl.[5] C07B *51/43;* C11B *3/00, 13/00*

U.S. Cl. 554—181 **12 Claims**

1. A process for producing stable ozonized oils from unsaturated vegetable oils comprising the steps of:

placing an unsaturated vegetable oil in a vessel having means for bubbling a gaseous mixture therethrough:

bubbling said gaseous mixture through said unsaturated vegetable oil to produce a saturated, ozonized oil, said unsaturated vegetable oil being maintained at a constant temperature and said gaseous mixture comprising ozone and oxygen:

acidifying said ozonized oil;

adding an aqueous solution of antioxidation or reducing agent;

extracting undesirable by-products from said ozonized oil, said undesirable by-products being produced in said bubbling step, by shaking the mixture of said ozonized oil and said aqueous solution in the presence of a redox reaction system, said redox system selected from the group comprising ascorbic acid, vitamin E, vitamin A and a quinoid/benzoid system, said redox system being capable of radicalic reaction; and

removing said aqueous solution, containing said undesirable by-products so that a stable ozonized oil containing beneficial peroxide products remains.

5,183,912

ORGANOPENTASILOXANE AND METHOD FOR ITS PREPARATION

Tadashi Okawa, Chiba, Japan, assignor to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1992, Ser. No. 832,152

Claims priority, application Japan, Feb. 13, 1991, 3-41270

Int. Cl.[5] C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—425 **16 Claims**

1. An organopentasiloxane having the formula

$$A—R^1—SiMe_2(OSiMe_2)_3OSiR^2_{(3-n)}(OR^2)_n$$

wherein Me denotes a methyl radical; A is selected from the group consisting of methacryloxy, glycidoxy and amino radicals; R^1 is a divalent organic group selected from the group consisting of an alkylene group having at least 2 carbon atoms and an alkyleneoxyalkylene group; R^2 is independently selected from monovalent hydrocarbon groups free of aliphatically unsaturated bonds; and n is an integer having a value of 1 to 3.

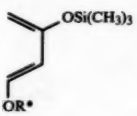
5,183,913

CYCLIC TRIKETONE COMPOUNDS AND TRIMETHYLSILYOXY BUTADIENE COMPOUNDS AND THEIR USE IN THE PREPARATION OF DAUNOMYCINQNE DERIVATIVES

Johan W. Scheeren, Malden; Joannes F. Martinus De Bie, Nijmegen, and Dirk De Vos, Oegstgeest, all of Netherlands, assignors to Pharmachemie B.V., Haarlem, Netherlands

Division of Ser. No. 473,538, Feb. 1, 1990, Pat. No. 5,097,051.
This application Dec. 20, 1991, Ser. No. 812,902
Claims priority, application Netherlands, Feb. 10, 1989, 8900329
Int. Cl.[5] C07F *7/08, 7/10, 7/18*
U.S. Cl. 556—446 10 Claims

1.1-alkoxy-3-trimethylsilyloxy-1,3-butadienes of formula (I)



(I)

wherein R* is a group of the formula

wherein R^1 is methyl and R^2 is an alkyl group containing at least 2 carbon atoms, or R^1 is an alkyl group having 1–4 carbon atoms and R^2 is selected from the group consisting of an aryl group, a $—CH_2OR'$ group, a $—CH_2N<$ group, a $—CH_2SR''$ group and a $—CH_2—CH=CH_2$ group, and wherein R' and R'' are alkyl groups having 1–4 carbon atoms.

5,183,914

ALKOXYSILANES AND OLIGOMERIC ALKOXYSILOXANES BY A SILICATE-ACID ROUTE

Li-Tain Yeh, Cleveland; Malcolm E. Kenney, Cleveland Heights, both of Ohio; Gary N. Bokerman; John P. Cannady, both of Madison, Ind., and Ollie W. Marko, Carrollton, Ky., assignors to Dow Corning Corporation, Midland, Mich. and Case Western Reserve University, Cleveland, Ohio

Filed Apr. 29, 1991, Ser. No. 692,413
Int. Cl.[5] C07F *7/18*
U.S. Cl. 556—467 30 Claims

1. A method of manufacturing alkoxysilanes comprising:
a) reacting a metal orthosilicate with an acid selected from the group consisting of sulfurous acid and acids with a pKa greater than about 2.5 in the presence of an alcohol and then
b) reacting the product of (a) with ROH to form $Si(OR)_4$, wherein R is an alkyl group of 1–20 carbon atoms.

5,183,915

CATALYST AND PROCESS FOR THE PRODUCTION OF 3-CYANO-3,5,5-TRIALKYLCYCLOHEXANONE

Christian Forguy, Devon, Pa.; Frederick J. Goetz, Wilmington, Del.; Edward L. Graeber, Spring City, and Michael J. Lindstrom, Downington, both of Pa., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Filed Mar. 5, 1992, Ser. No. 846,364
Int. Cl.[5] C07C *253/30, 253/10*
U.S. Cl. 558—341 15 Claims

1. A process for the preparation of 3-cyano-3,5,5-trialkylcyclohexanone by the reaction of 3,5,5-trialkylcyclohexenone having from 1 to 4 carbon atoms in each alkyl group with HCN in the absence of water and in the presence of a catalytic amount of a quaternary ammonium or quaternary phosphonim cyanide, and employing reaction conditions which will form 3-cyano-3,5,5-trialkylcyclohexanone.

5,183,916

PROCESS FOR PRODUCING TRI-N-BUTYLPHOSPHOROTRITHIOITE

Ara H. Zakaryan; Peter E. Newallis, and Mark A. Tice, all of Leawood, Kans., assignors to Miles Inc., Pittsburgh, Pa.

Filed Apr. 14, 1989, Ser. No. 339,043
Int. Cl.[5] C07F *9/06*
U.S. Cl. 558—95 10 Claims

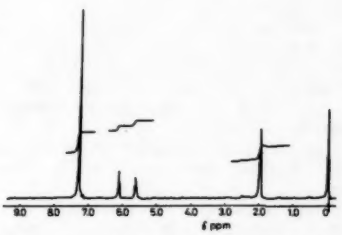
1. A process for the production of tri-n-butyl-phosphorotrithioite on a continuous or semi-continuous basis comprising
a) simultaneously introducing phosphorous trichloride and butylmercaptan into a reaction vessel which is maintained at a temperature of from about 60° to about 80° C.,
b) heating the mixture of a) to form tri-n-butylphosphotrithioite in a relatively substantial amount and,
c) recovering tri-n-butylphosphorotrithioite.

5,183,917

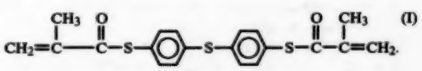
4,4'-BIS(METHACRYLOYLTHIO)DIPHENYLSULFIDE

Satoshi Maruyama, Kawasaki; Naoki Minorikawa; Tsutomu Arakawa, both of Kawasaki; Haruo Yoshida, Oita; Hirotsku Tagoshi, and Kazuto Abe, both of Oita, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

PCT No. PCT/JP89/01076, § 371 Date Jun. 20, 1990, § 102(e) Date Jun. 20, 1990, PCT Pub. No. WO90/04587, PCT Pub. Date May 3, 1990
PCT Filed Oct. 20, 1989, Ser. No. 499,421
Claims priority, application Japan, Oct. 20, 1988, 63-265776; Oct. 20, 1988, 63-265778; Dec. 14, 1988, 63-315559; Jun. 20, 1989, 1-157528; Jul. 21, 1989, 1-190203
Int. Cl.[5] C07C *327/00, 327/22*
U.S. Cl. 558—251 1 Claim



1. 4,4'-Bis(methacryloylthio)diphenylsulfide having the formula (I):



(I)

5,183,918

PROCESS FOR THE PRODUCTION OF CARBONATE ESTERS

Frank P. Jakse, Florissant; Donald E. Morris, Kirkwood, and William Vanderlinde, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 25, 1989, Ser. No. 398,591
Int. Cl.[5] C07C *69/00*
U.S. Cl. 558—271 16 Claims

1. In a process for synthesizing an alkylsulfophenyl carbonate having a straight or branched chain alkyl group containing from about 6 to about 12 carbon atoms or a cycloalkyl group containing from about 6 to about 9 carbon atoms wherein an

akly chloroformate is reacted with a phenolsulfonate in an aqueous alkaline medium, the improvement comprising adding to said alkaline medium an acidifying agent whereby the reaction mass is neutralized to a pH of about 7 or below while said carbonate is in a said aqueous medium.

5,183,919

PROCESS FOR THE PREPARATION OF DIARYL CARBONATES

Cynthia L. Rand, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 451,893, Dec. 18, 1989, abandoned. This application Jul. 30, 1991, Ser. No. 739,778

Int. Cl.[5] C07C *69/96*

U.S. Cl. 558—274 **18 Claims**

1. A process for the production of a diaryl carbonate comprising contacting an aryl haloformate with a phenolic compound in the presence of a catalytic amount of a catalyst comprising at least one aromatic heterocyclic nitrogen compound which has been activated by at least one hydroxyl substituent.

5,183,920

INTEGRATED PROCESS FOR THE PRODUCTION OF DIMETHYL CARBONATE

Harold D. Myers, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 13, 1992, Ser. No. 819,895

Int. Cl.[5] C07C *68/00, 69/96*

U.S. Cl. 558—277 **11 Claims**

1. An integrated process for the production of dimethyl carbonate from a carbon source suitable for the production of synthesis gas and oxygen comprising the steps of

(a) reacting the carbon source and oxygen to form a synthesis gas comprising hydrogen and carbon monoxide in a molar ratio of from 1:1 to 3:1;

(b) reacting the carbon monoxide and hydrogen formed in step (a) to produce methanol with excess carbon monoxide;

(c) reacting the methanol and carbon monoxide formed in step (b) with oxygen in the presence of a catalyst to form predominantly dimethyl carbonate and water;

(d) separating the products, any unreacted reactants and any by-products formed in steps (a), (b) and (c); and

(e) recycling any by-products formed in steps (a), (b) or (c) and any unreacted reactants.

7. An integrated process for the production of dimethyl carbonate from a carbon source suitable for the production of synthesis gas, oxygen and carbon dioxide, comprising the steps of

(a) reacting the carbon source, oxygen and carbon dioxide to form a synthesis gas comprising hydrogen and carbon monoxide in a molar ratio of from 1:1 to 3:1;

(b) reacting the carbon monoxide and hydrogen formed in step (a) to produce methanol with excess carbon monoxide;

(c) reacting the methanol and carbon monoxide formed in step (b) with oxygen in the presence of a catalyst to form predominantly dimethyl carbonate and water;

(d) separating the products, any unreacted reactants and any by-products formed in steps (a), (b) and (c); and

(e) recycling any by-products formed in steps (a), (b) or (c) and any unreacted reactants.

5,183,921

PROCESS FOR PRODUCING METHOXYIMINOACETAMIDE COMPOUNDS AND INTERMEDIATES

Akira Takase, Otsu; Hiroyuki Kai, Koriyama; Kuniyoshi Nishida, Koga; Shoji Shinomoto, Matsubara, and Masahiko Nagai, Amagasaki, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

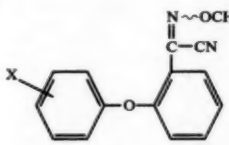
Filed Jul. 22, 1991, Ser. No. 733,303

Claims priority, application Japan, Jul. 26, 1990, 2-200696

Int. Cl.[5] C07C *255/34*

U.S. Cl. 558—301 **2 Claims**

1. A compound of the formula [II']:



[II']

wherein X is hydrogen, lower alkyl, lower alkoxy or halogen; and ~ is any configuration of E-isomer, Z-isomer or a mixture thereof.

5,183,922

PROCESS FOR THE OPTICAL RESOLUTION OF THREO-2-HYDROXY-3-(2'-AMINOPHENYLTHIO)-3-(4''-METHOXYPHENYL)-PROPIONIC ACID

Amleto Rizzi, Alte Ceccato, and Gaetano Marchioro, Vicenza, both of Italy, assignors to FIS - Fabbrica Italiana Sintetici S.p.A., Vicenza, Italy

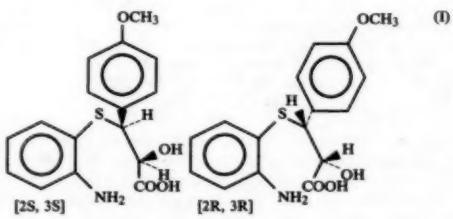
Filed Nov. 19, 1990, Ser. No. 615,686

Claims priority, application Italy, Nov. 23, 1989, 22496 A/89

Int. Cl.[5] C07C *319/28;* C07B *57/00*

U.S. Cl. 560—7 **5 Claims**

1. Process for resolving the optical antipodes of threo-2-hydroxy-3-(2'-aminophenylthio)-3-(4''-methoxyphenyl)-propionic acid, having the formula (I):



(I)

[2S, 3S] [2R, 3R]

characterized in that said acid is salified with cyclohexylamine in a polar organic solvent, and said optical antipodes are separated by means of the crystallization of their so formed enantiomeric salts.

5,183,923

PROCESS FOR PREPARING PRIMARY HYDROXYL-CONTAINING DIOLS

Michael Cuscurida, and George P. Speranza, both of Austin, Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Continuation-in-part of Ser. No. 179,826, Apr. 11, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 500,432

The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.[5] C07C *271/26*

U.S. Cl. 560—26 **6 Claims**

1. A method for preparing diols which contain essentially all

primary hydroxyl groups comprising reaction of ethylene oxide, propylene oxide and/or butylene oxide with ethylene, propylene or butylene glycol t-butyl ether, then coupling these reaction products with organic diisocyanates, dibasic acids, or dibasic esters followed by cleavage of the t-butyl group with an acid catalyst.

5,183,924

DERIVATIVES OF BENZOCYCLOALKENYLDIHYDROXYALKANOIC ACIDS, PROCESSES OF PREPARATION AND MEDICATIONS CONTAINING THEM

Didier Festal, Ecully; Jean-Yves Nioche, Limonest; Denis Descours, Villeurbanne; Robert Bellemin, Lyons, and Jacques Decerprit, Neyron, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyons, France

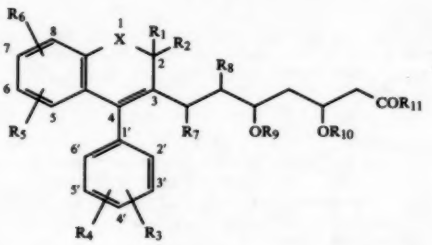
Division of Ser. No. 469,121, Jan. 24, 1990, Pat. No. 5,082,859. This application Oct. 24, 1991, Ser. No. 782,195

Claims priority, application France, Jan. 24, 1989, 89 00790

Int. Cl.[5] C03C *69/76*

U.S. Cl. 560—56 **14 Claims**

1. A compound formula I,



in which X denotes a —CH_2— methylene chain link; R_1 and R_2, which are identical or different, denote hydrogen atoms or alkyl radicals containing 1 to 3 carbon atoms; R_1 and R_2 may also together form a —$(CH_2)_n$— alkylene in which n is 4 or 5, optionally, substituted symmetrically by one or two alkyl radicals containing 1 to 3 carbon atoms; R_3 and R_4, which may be identical or different, denote hydrogen, fluorine, chlorine or bromine atoms, CF_3 radicals, N,N-dialkylamino containing 1 to 3 carbon atoms, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 5 carbon atoms, phenyl optionally substituted by at most two substituents which are identical or different and denote C_{1-3} alkyl radicals or fluorine or chlorine atoms, it being understood that when one of the substituents R_3 and R_4 denotes a CF_3, N,N-dialkyamino, phenyl or substituted phenyl radical, it is present on the 3', 4' or 5' vertex and the other substituent denotes a hydrogen atom; R_5 and R_6, which may be identical or different, denote hydrogen, fluorine, chlorine or bromine atoms or the radicals: CF_3, C_{1-3} alkyl, C_{1-3} alkoxy or phenyl, optionally substituted by one or two C_{1-3} alkyl radicals, C_{1-3} alkoxy or fluorine or chlorine atoms, on condition that when one of the substituents R_5 and R_6 denotes CF_3, phenyl or substituted phenyl radicals, it is present on the vertex 6 or 7 and the other denotes a hydrogen atom; the substituents R_3 and R_4 or R_6 may also together form, on condition of being on two contiguous vertices, the diradicals of formulae: —CH=CH—CH=CH—, —$(CH_2)_m$— or —$O(CH_2)_pO$—, in which m may be equal to 3 or 4 and p to 1 to 2, it being understood that when R_3 and R_4 or R_5 and R_6 denote the diradical —$O(CH_2)_pO$—, the latter is linked to the vertices 3' and 4' and 5' or 6 and 7; each of the substituents R_7 and R_8 denotes a hydrogen atom or, together with the existing C—C bond they form a double bond of trans (E) geometry; each of the substituents R_9 and R_{10} denotes a hydrogen atom or together they form a dialkylmethylene residue containing 1 to 3 carbon atoms, R_{11} denoting, with the CO group to which it is bonded, a free acid, ester, amide or acid salt functional group or forming a δ-lactone ring with R_9.

5,183,925

LEUKOTRIENE-B4 DERIVATIVES, PROCESS FOR THEIR PRODUCTION AND THEIR USE AS PHARMACEUTICAL AGENTS

Josef Heindl; Werner Skuballa; Bernd Buchmann; Wolfgang Frohlich, and Rolaind Ederdt, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

PCT No. PCT/DE90/00209, § 371 Date Nov. 19, 1990, § 102(e) Date Nov. 19, 1990, PCT Pub. No. WO90/11272, PCT Pub. Date Oct. 4, 1990

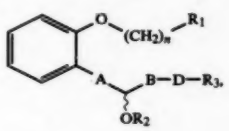
PCT Filed Mar. 16, 1990, Ser. No. 623,386

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3909326

Int. Cl.[5] C07C *69/76*

U.S. Cl. 560—61 **5 Claims**

1. Leukotriene-B_4 derivative of formula I,



(I)

in which

n=1–10,

R_1 means radical $COOR_4$ with R_4 meaning a hydrogen atom, an alkyl radical with 1–10 C atoms, a cycloalkyl radical with 3–10 C atoms, an aryl radical with 6–10 C atoms optionally substituted by 1–2 chlorine, bromine, phenyl, alkyl with 1–4 C atoms, chloromethyl, fluoromethyl, trifluoromethyl, carboxy, C_1–C_4 alkoxy or hydroxy, a —CH_2—CO—aryl radical with 6–10 C atoms for an aryl or a 5–6-member heterocyclic radical with at least 1 heteroatom,

A means a cis, trans or trans, trans—CH=CH—CH=CH group or tetramethylene group,

B means a straight-chain or branched-chain, saturated or unsaturated alkylene group with up to 10 C atoms which can optionally be substituted by fluorine, or the group

with n=1, 2 or 3,

D means a direct compound, oxygen, sulfur, a —C≡C group or a —CH=CR_8 group with R_8 as hydrogen, C_1–C_5 alkyl, chlorine or bromine,

B and D together mean a direct bond,

R_2 means a hydrogen atom or an acid radical of an organic acid with 1–15 C atoms and

R_3 means a hydrogen atom, an alkyl radical with 1–10 C atoms, an alkyl radical with 1–10 C atoms substituted by chlorine or bromine, a cycloalkyl radical with 3–10 C atoms; an aryl radical with 6–10 C atoms substituted optionally by 1–2 chlorine, bromine, phenyl, alkyl with 1–4 C atoms, chloromethyl, fluoromethyl, trifluoromethyl, carboxy, C_1–C_4 alkoxy or hydroxy; or a 5–6-member heterocyclic radical with at least 1 heteroatom and if R_5 means a hydrogen atom, their salts with physiologically compatible bases and their cyclodextrin clathrates.

5,183,926

PROCESS FOR THE PREPARATION OF AROMATIC DICARBOXYLIC ACIDS AND AROMATIC HYDROCARBONS

Richard Weider, Leverkusen, and Thomas Scholl, Meerbusch, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

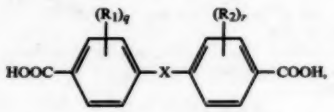
Continuation of Ser. No. 565,541, Aug. 9, 1990, abandoned. This application Sep. 13, 1991, Ser. No. 759,794

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1989, 3927772

Int. Cl.[5] C07C *69/773, 51/16, 1/32, 63/331*

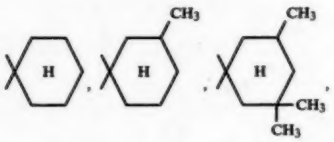
U.S. Cl. 560—76 **16 Claims**

12. An aromatic dicarboxylic acid of the formula

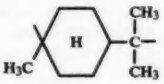


in which

X denotes a moiety selected from the group consisting of the formulae



and the group



R_1 and R_2, independently of one another, denote straight-chain or branched C_1–C_4-alkyl and

q and r, independently of one another, represent integers from 0 to 4, a dichloride or a di-C_1–C_4-alkyl ester of the dicarboxylic acid.

5,183,927

PROCESS FOR THE PREPARATION OF IODOALKYNYL CARBAMATES

Atsushi Utsunomiya; Mitsuo Nakamura; Toshiaki Kuwatsuka, all of Mobara, and Yoshinori Tanaka, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Apr. 15, 1992, Ser. No. 868,577

Claims priority, application Japan, Apr. 16, 1991, 3-83673

Int. Cl.[5] C07C *261/00*

U.S. Cl. 560—115 **13 Claims**

1. A process for the preparation of iodoalkynyl carbamates of the general formula (1)

$$[IC{\equiv}C{-}(CH_2)_n{-}OCONH]_mR \quad (1)$$

where R is a substituted or unsubstituted alkyl, cycloalkyl, aryl or aralkyl group containing 1 to 20 carbon atoms and having a valence of m, and m and n are whole numbers of 1 to 3, which comprises iodinating an alkynyl carbamate of the general formula (2)

$$[HC{\equiv}C{-}(CH_2)_n{-}OCONH]_mR \quad (2)$$

where R, m and n are as previously defined, with iodine monochloride.

5,183,928

PREPARATION OF HYDROQUINONE MONOCARBOXYLATES

Serge Ratton, Villefontaine, France, assignor to Rhone-Poulenc Specialities Chimiques, Courbevoie, France

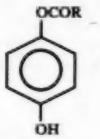
Continuation of Ser. No. 748,454, Jun. 25, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 163,196

Claims priority, application France, Jun. 25, 1984, 84 10184

Int. Cl.[5] C07C *67/03, 69/16, 69/28*

U.S. Cl. 560—144 **11 Claims**

1. A process for the preparation of a hydroquinone monocarboxylate having the general formula:



wherein R is a straight or branched chain alkyl radical having from 1 to 4 carbon atoms, comprising disproportionating a stoichiometric excess of a hydroquinone dicarboxylate with hydroquinone.

5,183,929

METHOD FOR PRODUCTION OF T-BUTYL 3-OXOBUTYRATES AND THEIR USE

Kenzo Naito, Kyoto; Yukio Ishibashi, Osaka, and Haruo Shinbo, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

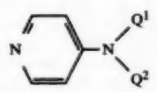
Division of Ser. No. 295,516, Jan. 11, 1989, Pat. No. 5,109,131. This application Oct. 3, 1991, Ser. No. 770,333

Claims priority, application Japan, Jan. 14, 1988, 63-6133; Jun. 29, 1988, 63-161984

Int. Cl.[5] C07C *67/46*

U.S. Cl. 560—178 **1 Claim**

1. A method of producing tert-butyl 3-oxobutyrate, characterized by allowing tert-butyl alcohol to react with diketene at a temperature of 25° C. to 80° C. for 0.3 to 3 hours in the presence of a 4-(tertiary amino)pyridine of the formula:



wherein Q^1 and Q^2 independently stand for a C_{1-6} group of are combined together with the adjacent nitrogen atom to form a cyclic amino group.

5,183,930

TRANSESTERIFICATION CATALYST

Jeremia J. Venter, Telford, and Christine McDade, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 17, 1992, Ser. No. 899,791

Int. Cl.[5] C07C *67/02*

U.S. Cl. 560—217 **9 Claims**

1. A process for the batch, continuous or semicontinuous preparation of carboxylic acid esters by ester interchange of a carboxylic acid ester with another carboxylic acid ester, an alcohol, or a carboxylic acid comprising heating the reactants at a temperature of between 50° C. and 200° C. in the presence of a supported transition metal transesterification catalyst prepared by:

a. preforming an oligomer by reacting water with a transition metal alkoxide of the general formula:

$$M(OR)_nQ_m$$

wherein M is a transition metal; OR is an alkoxy radical wherein R is an alkyl group of from 1 to 20 carbon atoms, n is an integer from 2 to the valence number of the transition metal M; Q is a group with valence number r which will not react with hydroxyl groups of the support, the alkoxide radical OR, or the alcohol ROH formed therefrom; and m is an integer such that n+rm equals the valence number of the transition metal M;

b. mixing a solution of the oligomer in an inert solvent with a solid substrate having a plurality of surface hydroxyl groups.

5,183,931

BENZYLIC OXIDATION AND CATALYST THEREFOR

Chung C. Tso, and Robert L. Wynn, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 10, 1992, Ser. No. 833,260

Int. Cl.[5] C07C *67/00, 51/16, 45/00, 33/18*

U.S. Cl. 560—241 **14 Claims**

1. A process for oxidizing an alkylaromatic having a benzylic hydrogen to its corresponding oxidized product selected from the group consisting of carboxylic acids, aldehydes, alcohols and esters comprising contacting said alkylaromatic in the presence of an oxygen-containing fluid in a reaction medium with a catalyst comprising a palladium salt, a metal persulfate, a third metal salt having a general formula of MX wherein M is an alkali or alkaline earth metal and X is selected from the group consisting of carboxylate, acrylate, sulfate, nitrate, phosphate, and halide and a tin salt, in a carboxylic acid under conditions sufficient to oxidize said benzylic hydrogen of said alkylaromatic.

5,183,932

HERBICIDAL SUBSTITUTED 4-AMINO-5-ALKYLTHIO-1,2,4-TRIAZOL-3-ONES

Klaus-Helmut Müller, Duesseldorf; Joachim Kluth, Langenfeld; Klaus König, Odenthal; Karl-Rudolf Gassen, Odenthal; Kurt Findeisen, Odenthal; Markus Lindig, Hilden; Klaus Lürssen, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 504,463, Apr. 4, 1990, Pat. No. 5,021,080. This application Feb. 12, 1991, Ser. No. 654,124

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1989, 3911219; Oct. 10, 1989, 3933750

Int. Cl.[5] C07C *265/10, 211/16*

U.S. Cl. 560—330 **3 Claims**

1. A compound of the formula (XV)

(XV)

in which

Z represents N=C=O, or NH_2.

5,183,933

PROCESS FOR PREPARING 2,6-NAPHTHALENE-DICARBOXYLIC ACID

Jon J. Harper; George E. Kuhlmann, both of Naperville; Keith D. Larson, Chicago; Rosemary F. McMahon, Wheaton, and Paul A. Sanchez, Lisle, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Oct. 15, 1991, Ser. No. 776,812

Int. Cl.[5] C07C *51/265*

U.S. Cl. 562—414 **21 Claims**

1. A process for producing 2,6-naphthalenedicarboxylic acid by the liquid phase oxidation of 2,6-dimethylnaphthalene, comprising:

(a) continuously adding to a reaction zone the oxidation reaction components comprising 2,6-dimethylnaphthalene, a source of molecular oxygen, a solvent comprising an aliphatic monocarboxylic acid, and a catalyst comprising cobalt, manganese and bromine components, wherein the weight ratio of monocarboxylic acid solvent to 2,6-dimethylnaphthalene is about 2:1 to about 12:1, the atom ratio of manganese to cobalt is about 5:1 to about 0.3:1, the atom ratio of bromine to the total of cobalt and manganese is about 0.3:1 to about 0.8:1, and the total of cobalt and manganese, calculated as elemental cobalt and manganese, is at least about 0.40 weight percent based on the weight of solvent added to the reaction zone;

(b) maintaining the contents of the reaction zone at a temperature of about 370° F. to about 420° F., and at a pressure of from about 0.1 atmosphere absolute to about 35 atmospheres absolute, thereby oxidizing the 2,6-dimethylnaphthalene to 2,6-naphthalenedicarboxylic acid; and

(c) continuously withdrawing from the reaction zone a product mixture comprising 2,6-naphthalenedicarboxylic acid.

5,183,934

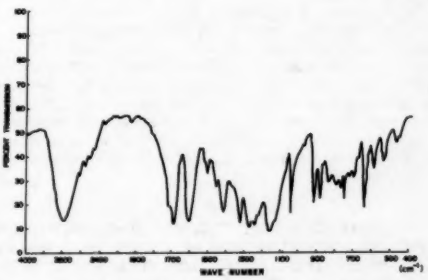
2-TRIFLUOROMETHYL-4-HYDROXYBENZOIC ACID

Yoshiichi Suzuki, Tokyo, Japan, assignor to Showa Shell Sekiyu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 599,456, Oct. 18, 1990, abandoned. This application Mar. 30, 1992, Ser. No. 859,961

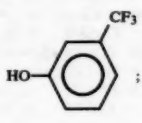
Int. Cl.[5] C07C *51/15*

U.S. Cl. 562—423 **3 Claims**

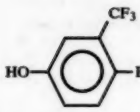


1. A process for preparing 2-trifluoromethyl-4-hydroxybenzoic acid comprising:

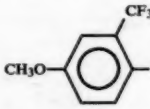
reacting a compound represented by the formula (I):



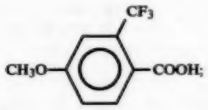
with bromine in a solvent whereby a compound represented by the formula (II) is obtained:



reacting a compound of formula (II) with methyl iodide at room temperature whereby a compound represented by the formula (III) is obtained:



reacting a compound represented by the formula (III) with magnesium and carbon dioxide to prepare the compound represented by the formula (IV)



and

reacting the compound having the formula (IV) with boron tribromide.

5,183,935

PROCESS FOR THE PREPARATION OF 5-(2',4'DIFLUOROPHENYL)-SALICYLIC ACID IN PURE FORM II

Claudio Giordano, Monza, and Maurizio Paiocchi, Milan, both of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

Filed Jul. 29, 1992, Ser. No. 921,066

Claims priority, application Italy, Aug. 1, 1991, MI91A002152

Int. Cl.[5] C07C *69/76*

U.S. Cl. 562—469 **5 Claims**

1. A process for preparing 5-(2',4'-difluorophenyl)-salicylic acid in form II substantially pure, consisting in dissolving a mixture of polymorphous crystals of 5-(2',4'-fidluorophenyl)-salicylic acid in a mixture of solvents consisting of an aromatic hydrocarbon and an aliphatic ketone at the reflux temperature, in adding a seed of 5-(2',4'-difluorophenyl)-salicylic acid in pure form II, in removing by distillation at least 90% by volume of the aliphatic ketone, in cooling to a temperature comprised between 10° and 20° C. and in filtering the suspension.

5,183,936

ANHYDROUS DILUENT PROCESS FOR THE PROPYLENE OXIDATION REACTION TO ACROLEIN AND ACROLEIN OXIDATION TO ACRYLIC ACID

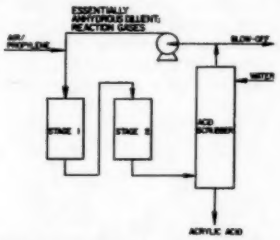
William G. Etzkorn, Cross Lanes, and Gordon G. Harkreader, Charleston, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 542,819, Jun. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 442,464, Nov. 30, 1989, abandoned, which is a continuation of Ser. No. 281,877, Dec. 8, 1988, abandoned, which is a continuation of Ser. No. 173,033, Mar. 28, 1988, abandoned, which is a continuation of Ser. No. 898,491, Aug. 21, 1986, abandoned. This application Oct. 25, 1991, Ser. No. 781,657

Int. Cl.[5] C07C *51/16*

U.S. Cl. 562—532 **21 Claims**

1. In a process for producing acrylic acid by a two-stage catalytic oxidation of propylene, wherein the first stage reaction produces primarily acrolein and the second stage reaction produces primarily acrylic acid by oxidation of acrolein, said process optionally using one or more recycle streams to either or both stages, both stages operating on feed streams containing oxygen and added inert diluent gas, the improvement comprising (a) utilizing one or more essentially inert essentially anhydrous diluent gases free of any intentionally-added water in a mole ratio of about 2.0 to about 32.0 moles of diluent per mole of propylene as the essentially inert essentially anhydrous



diluent gas feed added to the first stage, said added essentially inert anhydrous diluent gas feed having a composite heat capacity of at least 7.95 calories/gram-mole (°C.) and an oxygen-containing stream containing from about 1.1 to about 2.1 moles of molecular oxygen per mole of propylene and (b) utilizing one or more essentially inert essentially anhydrous diluent gases free of any intentionally added water as the inert diluent gas feed to the second stage, said added essentially inert anhydrous diluent having a composite heat capacity of at least about 7.95 calories/gram-mole (°C.)

5,183,937

ACETIC ACID RECOVERY

Mark R. Johnson, Grayslake, Ill., assignor to The NutraSweet Company, Deerfield, Ill.

Continuation of Ser. No. 479,902, Feb. 7, 1990, abandoned. This application Nov. 21, 1991, Ser. No. 798,361

Int. Cl.[5] C07B *51/42*

U.S. Cl. 562—608 **7 Claims**

1. In a process for the manufacture of N-formyl aspartic anhydride via the reaction of aspartic acid, formic acid, acetic anhydride in which crystals of N-formyl aspartic anhydride are formed and separated from a mother liquor which includes quantities of acetic acid, formic acid, acetic anhydride, formic acetic anhydride and high boiling aspartic acid derived components, the improvement comprising:

(a) separating said high boiling aspartic acid derived components from said mother liquor;

(b) heating said mother liquor to a temperature greater than or equal to about 70° C. for a time period ranging from about 1 hour to about 24 hours to convert all of said formic acetic anhydride to acetic acid and gaseous carbon monoxide and to fully deplete either said acetic anhydride or said formic acid, whichever is initially present in a stoichiometric lesser amount and thereby produce a mixture comprising acetic acid and either acetic anhydride or formic acid, whichever has not been depleted; and

(c) separating acetic acid initially present in the mother liquor and acetic acid formed in step (b) from the remainder of said mixture produced in step (b).

5,183,938

N,N'-BIS(4,4,4-TRINITROBUTYRYL)HYDRAZINE

Michael E. Sitzmann, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 15, 1992, Ser. No. 901,620

Int. Cl.[5] C07C *139/08*; C06B *47/08*

U.S. Cl. 564—151 **7 Claims**

1. N,N'-bis(4,4,4-trinitrobutyryl)hydrazine.

5,183,939

PROCESS FOR THE RACEMIZATION OF OPTICALLY ACTIVE 1-ARYL-ALKYLAMINES

Johannes R. Jansen, Monheim, and Martin Littmann, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

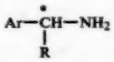
Filed Nov. 21, 1991, Ser. No. 796,109

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1990, 4038356

Int. Cl.[5] C07C *209/00*

U.S. Cl. 564—302 **4 Claims**

1. A process for the racemization of an optically active 1-aryl-alkylamine, which comprises reacting an optically active amine of the formula (I)



(I)

in which

C is an asymmetric carbon atom,

Ar is phenyl or naphthyl which is optionally monosubstituted to pentasubstituted by identical or different substituents selected from the group consisting of halogen, and alkyl, haloalkyl, alkoxy, haloalkoxy, alkythio, alkylsulphinyl or alkylsulphonyl in each case having 1 to 4 carbon atoms and in each case being straight-chain or branched, and

R is alkyl having 1 to 6 carbons atoms,

with an alkali, alkaline earth metal or earth metal alkoxide, in dimethyl sulphoxide at a temperature from 0° to 200° C.

5,183,940

POLY-(N-[2-HYDROXYBENZYL])-1,2-DIAMINOETHANES

Peter M. Quan, Rochdale, and Stephen W. Leeming, Flixton, both of England, assignors to Imperial Chemical Industries PLC, London, England

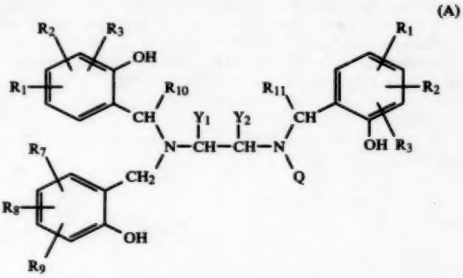
Continuation of Ser. No. 68,136, Jun. 29, 1987, abandoned. This application May 11, 1991, Ser. No. 884,230

Claims priority, application United Kingdom, Jul. 14, 1986, 8617118; Oct. 1, 1986, 8623570; May 15, 1987, 8711539

Int. Cl.[5] C07C *215/50*

U.S. Cl. 564—370 **9 Claims**

1. A compound of the general formula (A):



(A)

wherein:

Q is a hydrogen atom or a group $—CH_2Z$;

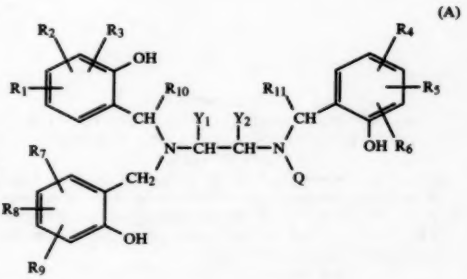
Z is a 2-hydroxyphenyl group R_1 is a hydrocarbyl group R_2, R_3, and R_7 to R_{11} are each, independently, a hydrogen atom;

Y_1 is a hydrogen atom, or an alkyl group containing up to 20 carbon atoms, or a phenyl group;

Y_2 is a hydrogen atom or an alkyl group containing up to 20 carbon atoms, or Y_1 and Y_2, together with the group form a saturated or unsaturated ring system; and

R_1, Y_1 and Y_2 are the same or different and together contain in total from 10 to 60 saturated carbon atoms.

2. A compound of the general formula (A):



(A)

wherein:

Q is a hydrogen atom, a hydrocarbyl group or a group $—CH_2Z$;

Z is a —COOH group or a 2-hydroxyphenyl group which may optionally be substituted by the groups R_{12}, R_{13} and R_{14};

R_1 to R_9, and R_{12} to R_{14}, which may be the same or different, are substituent groups selected from hydrogen, hydrocarbyl, alkoxy, halogen, hydrocarbyl sulphonyl, acyl, amino, nitro and cyano or, when R_1 and R_2 and/or R_4 and R_5 are adjacent substituents they may complete a benzo ring and R_1 to R_9 and R_{12} to R_{14} are such that the substituents on at least one of the rings are different form the substitutents on at least one other of the rings;

R_{10} and R_{11} are each, independently, a hydrogen atom or an alkyl group containing up to 20 carbon atoms;

Y_1 is a hydrogen atom, or an alkyl group containing up to 20 carbon atoms, or a phenyl group;

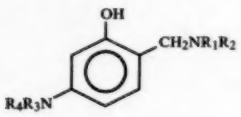
Y_2 is a hydrogen atom or an alkyl group containing up to 20 carbon atoms, or Y_1 and Y_2, together with the group form a saturated or unsaturated ring system; and R_1 to R_{14}, Y_1 to Y_2 are the same or different and together contain in total from 10 to 60 saturated carbon atoms.

5,183,941
HAIR DYE COUPLER COMPOUNDS

Yuh-Guo Pan, Stamford, Conn.; Alexander Chan, Mineola, N.Y., and Lana Hochman, Westport, Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 353,925, May 18, 1989, abandoned.
This application Oct. 23, 1990, Ser. No. 602,014
Int. Cl.[5] C07C *211/49*
U.S. Cl. 564—390 9 Claims

1. An oxidative hair dye coupler compound including its acid salts having the structure:



(I)

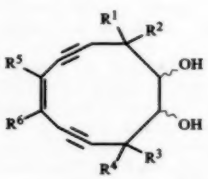
wherein R_1 and R_2 may be the same or different and are hydrogen or alkyl of from 1 to 6 carbons in the alkyl moiety, and R_3 and R_4 are hydrogen, alkyl and hydroxyalkyl, the alkyl group having from 1 to 6 carbons, said compound (I), when coupled with a paraphenylenediamine primary intermediate providing a dye characterized by a blue to blue-violet color.

5,183,942
TEN-MEMBERED RING ENEDIYNEDIOLS AND ENEDIYNEDIONES HAVING DNA CLEAVING PROPERTIES

Kyriacos C. Nicolaou; Erik Sorensen, both of La Jolla; Chan-Kou Hwang, San Diego, all of Calif.; Robert Discordia, Liverpool, N.Y.; Robert G. Bergman, Kensington, and Robert E. Minto, Albany, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Nov. 5, 1991, Ser. No. 788,161
Int. Cl.[5] C07C *49/105, 35/20*
U.S. Cl. 568—375 8 Claims

1. A compound of the formula



wherein

R^5 and R^6 are each hydrogen or R^5 and R^6 together with the carbon atoms of the depicted vinylene group forms a group W that is an aromatic monocyclic ring or bicyclic fused ring system that includes five or six atoms in the ring containing the depicted vinylene group; and

R^1, R^2, R^3 and R^4 are the same or different and are selected from the group consisting of hydrogen, C_1–C_6 alkyl, phenyl or benzyl, with the provisos that only one of R^1 and R^2 and one of R^3 and R^4 is hydrogen.

5,183,943
REACTIVATION OF HYDROFORMYLATION CATALYSTS

David R. Bryant, South Charleston; James E. Babin, Hurricane; James C. Nicholson, Charleston, all of W. Va., and Donald J. Weintritt, Jr., Houston, Tex., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Mar. 18, 1991, Ser. No. 670,874
Int. Cl.[5] C07C *45/50*
U.S. Cl. 568—454 15 Claims

1. A process for improving the catalytic activity of a solubilized rhodium tertiary organophosphine complex hydroformylation catalyst which has become partially deactivated due to halide and/or carboxylic acid poisoning, said process consisting essentially of

(1) mixing under non-hydroformylation conditions, an organic liquid medium containing said solubilized partially deactivated rhodium-tertiary organophosphine complex catalyst, with an aqueous solution containing from about 1 to about 25 percent by weight of a tertiary alkanolamine having the formula

wherein R represents a hydroxyalkyl radical having from 2 to 4 carbon atoms; wherein R^1 and R^2 each individually represent a radical selected from the group consisting of alkyl radicals having from 1 to 4 carbon atoms, hydroxyalkyl radicals having from 2 to 4 carbon atoms, and a phenyl radical, to form a water-soluble salt between said tertiary alkanolamine and said halide and/or carboxylic acid;

(2) allowing the resulting mixture to settle into two distinct liquid phases;

(3) separating the aqueous phase which contains said salt from the organic phase containing the solubilized rhodium-tertiary organophosphine complex hydroformylation catalyst resulting from steps (1) and (2); and;

(4) washing the separated organic phase obtained by step (3) with water, and recovering a solubilized rhodium-tertiary organophosphine complex hydroformylation catalyst that is more catalytically active than said Partially deactivated rhodium-tertiary organophosphine complex hydroformylation catalyst starting material.

5,183,944
METHOD OF DOPING AQUEOUS SOLUTIONS WITH ACROLEIN IN BIOCIDALLY EFFECTIVE CONCENTRATION

Peter Werle; Martin Trageser, both of Gelnhausen-Hoechst, and Hermann Piana, Hanau, all of Fed. Rep. of Germany, assignors to Degussa AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 26, 1991, Ser. No. 798,159
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1990, 4038471
Int. Cl.[5] C07C *45/00*
U.S. Cl. 568—465 16 Claims

1. A method for doping aqueous solutions with acrolein in biocidally effective concentration, said method comprising

(a) forming acrolein by deacetalization of acrolein acetal in aqueous phase with a strongly acidic catalyst,

(b) removing acrolein formed during said deacetalization from said aqueous phase, and

(c) transferring said acrolein into an aqueous solution to be doped by (I) conducting an inert gas stream through said aqueous phase to become doped with acrolein and introducing said gas stream into said aqueous solution to be doped, dissolving said acrolein out of said gas stream into said aqueous solution; or (II) by lowering the pressure over said aqueous phase using a liquid jet pump whose

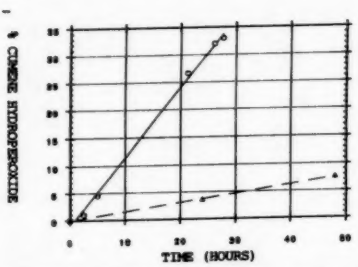
motive fluid is the aqueous solution to be doped or water to be added to it, in which the drawn off acrolein dissolves.

5,183,945

CATALYTIC PRODUCTION OF ARYL ALKYL HYDROPEROXIDES BY MANGANESE COMPLEXES

Robert T. Stibrany, Long Valley, and Sergiu M. Gorun, Upper Montclair, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Nov. 18, 1991, Ser. No. 794,096
Int. Cl.[5] C07C *409/22, 409/00*
U.S. Cl. 568—574 **9 Claims**

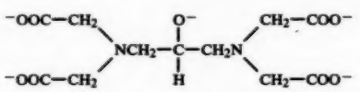


1. A process for preparing organic hydroperoxides by selectively converting aryl alkyl hydrocarbons to the corresponding organic hydroperoxides, comprising: contacting aryl alkyl hydrocarbons wherein the aryl alkyl hydrocarbons contain a benzylic hydrogen of the general formula:

wherein R_1 and R_2 may be organo groups or hydrogen groups and may be the same or different from each other with an oxygen-containing gas and a catalytically effective amount of a tetranuclear manganese complex catalyst having the formula:

$$M_2[Mn_4(O)(OH)(O_2CR)_2L_2]$$

wherein M is an alkali metal or an alkaline earth metal, R is selected from the group consisting of hydrogen and a hydrocarbyl group and L is a ligand having the formula:



to produce the corresponding organic hydroperoxides.

5,183,946

VINYLOXY HYDROXYALKYLCYCLOALKANE AND PREPARATION THEREFOR

Kou-Chang Liu, Wayne, and Paul D. Taylor, West Milford, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 371,168, Jun. 26, 1989, abandoned, which is a division of Ser. No. 307,457, Feb. 8, 1989, abandoned. This application Mar. 16, 1992, Ser. No. 852,421
Int. Cl.[5] C07C *41/00*
U.S. Cl. 568—670 **10 Claims**

1. A method of synthesizing the compound

$$HO(CH_2)_x—A—(CH_2)_{x'}OCH=CH_2$$

wherein x has a value of from 1 to 10; x' has a value of from 0 to 10 and A is a cycloalkylene group having from 3 to 8 carbon atoms in the ring and is optionally substituted with lower alkyl, which comprises reacting a diol having the structure

$$HO(CH_2)_x—A—(CH_2)_{x'}OH$$

wherein x, x' and A are as defined with acetylene in an inert diluent in an oxygen free atmosphere at a temperature of from about 120° C. and about 200° C. under a pressure of from about 10 psig. to about 200 psig. and recovering the product of the process.

5,183,947

ONE STEP SYNTHESIS OF METHYL T-BUTYL ETHER FROM T-BUTANOL USING FLUOROPHOSPHORIC ACID-MODIFIED CLAY CATALYSTS

John F. Knifton, Austin, and John R. Sanderson, Leander, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Jun. 19, 1992, Ser. No. 900,999
Int. Cl.[5] C07C *41/09*
U.S. Cl. 568—698 **7 Claims**

1. In a method wherein t-butanol is reacted with methanol in one step in the presence of a catalyst to provide methyl tert-butyl ether, the improvement comprising using as a catalyst a montmorillonite clay modified with an acid from the group consisting of a fluorophosphoric acid or phosphoric acid and continuously contacting said t-butanol and methanol in a molar amount of about 0.1 to 10 moles of methanol per mole of t-butanol with said catalyst at a temperature of about 20° C. to about 250° C. and a pressure of about atmospheric to about 1000 psig to obtain methyl tert-butyl ether product.

5,183,948

Patent Not Issued For This Number

5,183,949

RABBIT MODEL FOR DIAGNOSING AND TESTING VACCINES OR THERAPEUTIC AGENTS AGAINST AIDS

Thomas J. Kindt; Henrietta Kulaga, both of Bethesda, Md., and Thomas M. Folks, Atlanta, Ga., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 247,931, Sep. 22, 1988, abandoned. This application Mar. 15, 1989, Ser. No. 323,778
Int. Cl.[5] A61K *35/00*
U.S. Cl. 800—2 **2 Claims**

1. A rabbit infected with HIV-1 virus, said rabbit produced by the injection of human T-cells infected in vitro with HIV-1.

5,183,950

COMMERCIAL STORAGE AND SHIPMENT OF ENTOMOGENOUS NEMATODES

Irene Popiel, Mountain View; Karen D. Holtemann, San Jose, both of Calif.; Itamar Glazer, Bet Dagon, Israel, and Christopher Womersley, Honolulu, Hi., assignors to Biosys, Palo Alto, Calif.

Continuation-in-part of Ser. No. 897,660, Aug. 18, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,530
Int. Cl.[5] C12N *5/18;* A01K *67/00;* A01N *25/34*
U.S. Cl. 800—2 **4 Claims**

1. A process for placing entomogenous nematode infective juveniles selected from the group consisting of *N. carpocapsae, N. bibionis,* and *H. heliothidis* in an anhydrobiotic state which process comprises:

(a) substantially removing bulk surface moisture from said infective juveniles; and

(b) inducing anhydrobiosis in said infective juveniles by exposure to air at a relative humidity of 97±2% for a period sufficient to achieve anhydrobiosis as defined by one or more of the following survival characteristics wherein:

(i) more than 60% survive when said nematodes are suspended in 20% methanol, said methanol is cooled to liquid nitrogen temperature for 24 hours, and said suspension is rapidly brought to room temperature;

(ii) more than 90% survive when maintained in an airtight container at a nematode/volume ratio of 10^6/30 ml of air atmosphere for

(1) 10 days at 25° C., or

(2) 8 days at 30° C., or

(3) 6 days at 35° C.;

(iii) said infective juveniles require less than 1 ml oxygen per 80 mg dry weight nematodes per day at 25° C. in the absence of external moisture; or

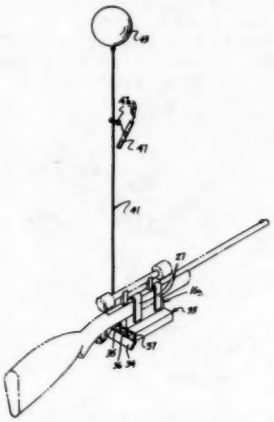
(iv) more than 90% of said infective juveniles survive exposure to air at 45° C. for 2 hr.

5,183,951

WEAPONRY SIGNAL APPARATUS

Richard R. Bilodeau, 227 Bean Hill Rd., Laconia, N.H. 03246

Filed Sep. 26, 1991, Ser. No. 765,874
Int. Cl.[5] F41A *17/08*
U.S. Cl. 42—1.01 **4 Claims**



1. A weaponry signal apparatus for securement to a weapon, wherein the apparatus includes

a housing, the housing including a transmitter and receiver, and

a housing first end wall spaced from a housing second end wall, and

the housing first end wall including an indicator light member means mounted thereon for illumination upon reception of a signal by the receiver from a remote transmitter, and

a first switch means for effecting selective actuation of the transmitter and receiver, and

the housing including a flange for securement of the housing to the weapon, and

the housing including a housing forward wall spaced from a housing rear wall, the housing forward wall mounting the switch means thereon, and

the housing forward wall includes a flashlight switch, the flashlight switch operatively associated with a flashlight lens directed through the housing second end wall for selective illumination of the flashlight lens, and the housing forward wall further including a plurality of spaced first hook and loop fastener patches spaced apart a predetermined spacing, and the housing rear wall including a plurality of spaced flexible straps spaced apart the predetermined spacing, each strap of the spaced flexible straps includes a second hook and loop fastener patch operative with one of said first hook and loop fastener patches, and a flexible antenna cable in operative association with the receiver, the flexible antenna cable secured to a flexible antenna at a junction, the junction including a clamp, and the clamp arranged for securement to a telescopic mount of the weapon.

5,183,952

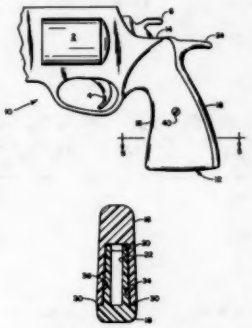
REVOLVER HAND GRIP

Francisco J. Morales, 758 Silver La., East Hartford, Conn. 06118

Filed Apr. 18, 1991, Ser. No. 687,183
Int. Cl.[5] F41C *23/10*
U.S. Cl. 42—71.02 **7 Claims**

1. A hand grip apparatus for an associated revolver which comprises:

first and second clam shell shaped portions; said first and second clam shell shaped portions are disposed in nested relationship, one of said portions including a tang dimensioned and configured to engage the hand of the user at



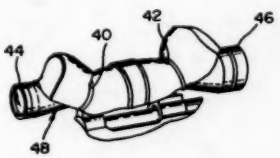
the web intermediate the thumb and forefinger and further including a third clam shell portion that is substantially the same as said one portion except that said third portion does not include a tang.

5,183,953

FLEXIBLE COVER/GUARD FOR RIFLE AND PISTON SCOPES HAVING A RESILIENT PROTECTIVE INNER PORTION AND A FABRIC OUTER PORTION SECURED THERETO

Robert A. Anderson, and Eric D. Anderson, both of Oak Harbor, Wash., assignors to Anderson Manufacturing Company, Inc., Oak Harbor, Wash.

Filed Jan. 8, 1992, Ser. No. 817,782
Int. Cl.[5] F41A *35/02*; B65D *65/02, 85/00*
U.S. Cl. 42—96 **7 Claims**



1. A cover/guard assembly for use with rifle and pistol scopes, comprising:

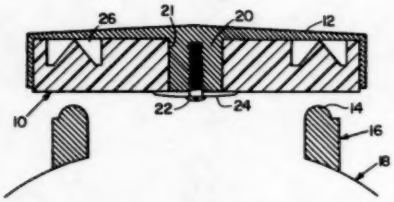
a cover element which includes a main body section which extends for the length of the scope and two end sections secured to the ends of the main body section in such a manner that the main body section is approximately U-shaped, such that the main body section extends over the top and down the sides of the scope and the end sections extend down the front and rear ends of the scope, wherein the cover element includes a stretchable, flexible, resilient protective inner portion and a stretchable fabric outer portion secured to the inner portion, permitting said sections of the cover element to be conveniently sewn together and thereafter to be stretched together to fit over the scope.

5,183,954

CUSHION FOR A TONE HOLE PAD

Steven A. Wasser, Wellesley, Mass., assignor to Verne O. Powell Flutes, Inc., Waltham, Mass.

Filed Aug. 27, 1990, Ser. No. 573,622
Int. Cl.[5] G10F *1/12*
U.S. Cl. 84—385 P **15 Claims**



4. A cushioned pad, receivable by a cup, for engaging with the rim of a tone hole of a musical instrument comprising;

a valving surface portion, of a first density, for sealably contacting the rim of the tone hole; and

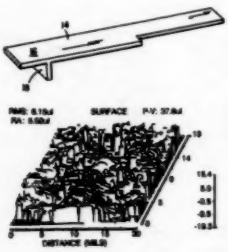
a compressible portion, of a second density, receivable within the interior of the cup and in contact with said valving surface portion, including at least one cavity in communication with the interior of the cup for providing compliance in said valving surface portion and for damping noise generated by the contact of said valving surface portion with said tone hole rim.

5,183,955

PIANO KEY COVERS FORMED OF IVORY SUBSTITUTE AND PIANOS HAVING SAME

Salvadore J. Calabrese, Clifton Park; Henry A. Scarton, Troy; S. Frank Murray, Clifton Park; Christopher M. Ettles, Glenmont; Warren C. Kennedy, Feura Bush; Saim Dinc; Bessem Jlidi, both of Troy, all of N.Y., and William Strong, Stamford, Conn., assignors to Renselaer Polytechnic Institute, Troy, N.Y. and Steinway Musical Properties, Inc., Waltham, Mass.

Filed May 18, 1990, Ser. No. 525,468
Int. Cl.[5] G10C *3/12*
U.S. Cl. 84—437 **10 Claims**



1. A piano key cover of synthetic material formed by a method comprising:

providing a mold for a piano key cover,

engraving a surface of said mold with a randomly oriented pattern of peak-to-valley texture replicating that characteristic of a surface of natural ivory,

placing in the mold a composition comprising suitable synthetic material pigmented to resemble natural ivory and filler, said filler being removable from a molded article by further treatment,

forming a piano key cover within said mold, said piano key cover having a surface, and

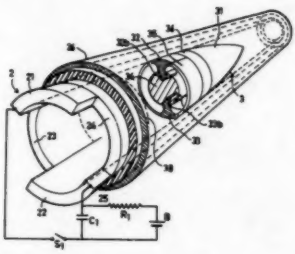
treating said piano key cover to remove said filler thereby causing said surface of said piano key cover to define a plurality of fine pores, replicating the surface of natural ivory.

5,183,956

PROJECTILE-LAUNCHING DEVICE

Gideon Rosenberg, Kiryat Tivon, Israel, assignor to State of Israel, Ministry of Defence Rafael-Armamend Development Authority, Haifa, Israel

Filed Nov. 27, 1990, Ser. No. 618,562
Claims priority, application Israel, Nov. 28, 1989, 92477
Int. Cl.[5] F41B *6/00*
U.S. Cl. 89—8 **15 Claims**



1. A device for accelerating a projectile to an extremely high velocity comprising:

a cylindrical launch tube, and a projectile assembly within said launch tube;

said launch tube including a pair of launch tube electrodes engageable with said projectile assembly for applying a high electrical voltage thereto;

said projectile assembly including the projectile to be accelerated, and a pair of travelling electrodes fixed to the rear end of the projectile and engageable with said a pair of launch tube electrodes during the travel of the projectile assembly through the launch tube;

said travelling electrodes being spaced circumferentially of the projectile assembly by insulating spacers, such as to be in sliding contact with said launch tube electrodes and to define a spark gap extending radially of the projectile assembly;

at least one of said pair of electrodes extending axially of said launch tube;

said projectile assembly further including a solid dielectric propellant in said spark gap which, by an electrical arc generated by the high voltage applied from said launch tube electrodes to said travelling electrodes, is quickly vaporized to form high-temperature, high-pressure gases travelling with the projectile and effective to increase its acceleration.

5,183,957

METHOD AND CONSTRUCTION FOR CONTROL OF CURRENT DISTRIBUTION IN RAILGUN ARMATURES

William F. Weldon; Herbert H. Woodson, and Glen C. Long, all of Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 203,556, Jun. 1, 1988, Pat. No. 4,953,441, which is a continuation of Ser. No. 885,915, Jul. 15, 1986, abandoned. This application Apr. 13, 1990, Ser. No. 509,057
The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.
Int. Cl.[5] F41B *6/00*
U.S. Cl. 89—8 **2 Claims**

1. An electromagnetic railgun comprising:

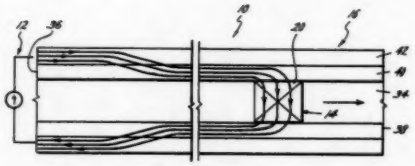
an electrical power supply;

solid armature means having a leading edge and a trailing edge; and

rail means having a pair of spaced, juxtaposed rails defining an elongated bore therebetween and operable for receiving the solid armature means along the length of the bore,

the rail means being operably connected to the power supply to provide a current flow path through one of the rails, and into the other rail to propel the solid armature means along the bore in the direction of the leading edge when power is supplied,

the rail means including a layer of a copper and graphite mixture extending along substantially the entire length



of the bore for permitting rapid current penetration between the solid armature and layer to inhibit the concentration of current density and eliminate arcing in the region of the trailing end of the solid armature means as the solid armature means is propelled along the bore,

the rail means including a layer of high conductivity material adjacent the layer of copper and graphite mixture and extending substantially the length thereof, the high conductivity material having a conductivity greater than the conductivity of the copper and graphite mixture.

5,183,958

NONMETALLIC GUN BARREL

Paul A. Petrovich, 11267 Judd Rd., Fowlerville, Mich. 48836

Division of Ser. No. 774,949, Oct. 11, 1991. This application Jun. 22, 1992, Ser. No. 901,647

Int. Cl.[5] F41A *21/04, 21/18*

U.S. Cl. 89—16 **15 Claims**

1. A gun barrel, comprising:

a tubular exterior portion;

a generally cylindrical interior portion divided into liner segments on an inner diameter of the exterior portion, the liner segments being harder and less elastically deformable than the exterior portion;

wherein sides of the segments define gaps between the segments;

elastic bodies protruding from the exterior portion into the gaps, the elastic bodies slidable against the sides;

whereby radially outward motion of the segments causes the elastic bodies to slide further into the gaps.

5,183,959

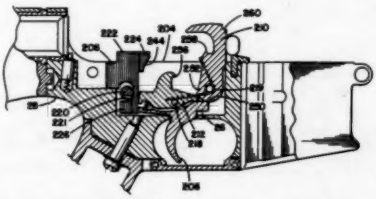
SEMI-AUTOMATIC FIREARM HAVING A SAFETY DEVICE PREVENTING CONVERSION TO FULL AUTOMATIC FIRING

Horace C. McCoan, Manchester, and James V. Collier, Vernon, both of Conn., assignors to Colt's Manufacturing Company Inc., West Hartford, Conn.

Filed Aug. 1, 1990, Ser. No. 561,450

Int. Cl.[5] F41A *19/00*

U.S. Cl. 89—148 **15 Claims**



1. An anti-conversion block for use in a semi-automatic firearm for preventing conversion of the firearm to a fully automatic firearm, the block comprising:

a first section having means for preventing operational installation of a predetermined type of trigger into the firearm;

a second section having means for preventing the operational installation of a predetermined type of hammer in the firearm; and

a third section having means for preventing the operational installation of a predetermined type of bolt assembly into the firearm.

5,183,960

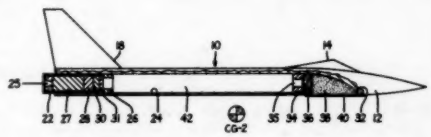
ROCKET GLIDER STABILIZATION SYSTEM

James D. Shires, 28 W. Governor Dr., Newport News, Va. 23602

Filed Jun. 27, 1991, Ser. No. 722,528

Int. Cl.[5] F42B *4/08*; A63H *27/00*

U.S. Cl. 102—348 **15 Claims**



1. A rocket glider comprising:

a model rocket propelled aircraft having a center of gravity located at substantially the longitudinal center thereof;

a rocket engine having a solid rocket propellant disposed in the aft end of said aircraft for propelling said model aircraft;

a counterweight bay formed in the nose end of said model aircraft;

a counterweight material releasably provided in said counterweight bay to balance or offset the weight of said rocket engine and thereby maintain the center of gravity of said aircraft at substantially the longitudinal center thereof;

whereby when said model rocket aircraft is propelled on a flight by said rocket engine, as said solid propellant is expended from said rocket engine, the center of gravity of the aircraft will shift toward the aircraft nose end to effect a pitch down movement for said aircraft and including,

means responsive to the depletion of said solid propellant for releasing said counterweight material into the atmosphere and thereby return the center of gravity of the aircraft to

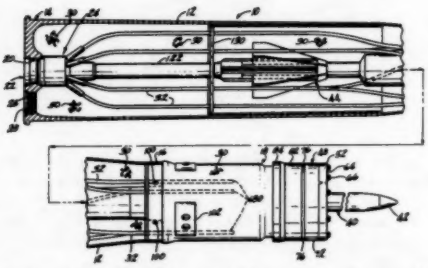
the substantially longitudinal center thereof to facilitate a controlled glide flight path back to the ground.

5,183,961

EXTENDED CHARGE CARTRIDGE ASSEMBLY

Ralph F. Campoli, Mine Hill, N.J., and John T. McGovern, Lancaster, Pa., assignors to Olin Corporation, Cheshire, Conn.

Filed Dec. 9, 1991, Ser. No. 803,806
Int. Cl.[5] F42B *5/067, 5/02*
U.S. Cl. 102—439 **22 Claims**



1. A cartridge assembly comprising a projectile assembly and a tubular cartridge case including a primer head and containing a propellant charge, said projectile assembly comprising:

a subcaliber elongated rod shaped penetrator;

a segmented sabot encircling and gripping a portion of said penetrator, said sabot having a generally annular front bourrelet providing a pressure barrier between said penetrator and said gun tube and an aft bourrelet spaced rearwardly from said front bourrelet having a plurality of circumferentially spaced post and shoe portions providing spaced lateral support to a portion of said penetrator; and

a combustible tubular case extension over said sabot between said bourrelets forming an annular cavity thereunder open to the interior of said tubular cartridge case between said post portions of said aft bourrelet, said cavity containing a portion of said propellant charge.

5,183,962

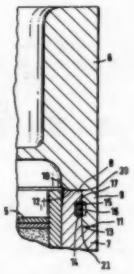
SUBMUNITION FOR A SPIN STABILIZED CARRIER PROJECTILE

Klaus D. Karius, Jüchen; Armin Eskam, Langenfeld, and Karl-Heinz Vogt, Essen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed May 18, 1992, Ser. No. 884,141
Claims priority, application Fed. Rep. of Germany, May 17, 1991, 4116191
Int. Cl.[5] F42B *12/58*
U.S. Cl. 102—489 **11 Claims**

1. In a submunition unit for a spin stabilized carrier projectile comprising:

an outer casing having a first axially extending annular collar at its front end; an antenna mounted in said casing at said front end; a protective cover for said antenna, said cover having a second axially extending annular collar at its rear end, with said first and second collars axially overlapping and engaging one another and with a radially extending end surface of at least one of said collars engaging a radially extending surface associated with the other of said collars to axially support said cover on said casing; and means for securing said protective cover to said casing including a locking element mounted for movement in a direction toward the circumference of said casing to form a form-locking connection between said cover and said casing in response to an appropriate centrifugal force acting on said unit and to release the connection between said cover and said casing when the number of revolutions of said unit, and thus the centrifugal force, drops below a given value; the improvement wherein said locking element is a securing ring which expands under the influence of centrifugal forces, and said means further comprises: a first circumferential groove on an exterior surface of the radially inward one of said first and second collars, said first circumferential groove having a depth corresponding to the thickness of said securing ring in the radial direction and normally containing said securing ring; and a second



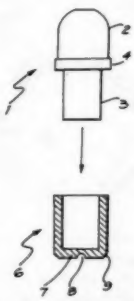
circumferential groove formed on an interior surface of the radially outer one of said first and second collars opposite said first circumferential groove, with said second circumferential groove having a depth less than said thickness of said securing ring, and both of said grooves having an axial height which includes an amount of play relative to the axial height of said securing ring that is greater than the axial deformation caused by the deformation forces generated at said first and second collars during launching of said unit.

5,183,963

TWO PIECE PROJECTILE

Stephen C. Beaufils, 14 Endeavour Road, George's Hall, Australia 2198 , and Alfonso Latella, 69 Ely Street, Revesby, Australia 2212

Filed Nov. 12, 1991, Ser. No. 789,982
Claims priority, application Australia, Nov. 13, 1990, PK3332
Int. Cl.[5] F42B *14/00*
U.S. Cl. 102—515 **10 Claims**



1. A projectile for use in a rifled gun barrel comprising:

a slug having a nose section at one end, a driving band circumferentially about the nose section and a shank section at an opposite end;

a jacket of plastics material, being a generally hollow smooth outer walled cylinder with a closed base encasing the shank section of the slug; and

fixing means securing the slug and jacket combination to-

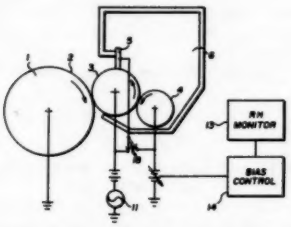
gether sufficiently strongly to maintain the combination together during firing and subsequent flight of the projectile and wherein in combination the driving band and jacket have dimensions in relation to a pre-selected nominal rifled gun bore so that when fired along said bore the driving band and jacket engage the rifling to spin the projectile.

5,183,964

TONER CHARGE CONTROL

Eric C. Stelter, Rochester, and Joseph E. Guth, Holley, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1992, Ser. No. 816,891
Int. Cl.[5] G03G *15/06*
U.S. Cl. 118—653 **6 Claims**



1. A method of developing electrostatic images on an image surface with toner from a toner supply, said method comprising the steps of:

rotating a toner-adder member in contact with a developer member to apply said toner to said developer member,

charging said toner at least in part by applying an electric field between the toner-adder member and the developer member, and

bringing such charged toner applied to the developer member into toner-applying relation with said electrostatic image to develop said image,

characterized by the steps of determining or predicting the ambient relative humidity and varying said electric field as a function of such relative humidity to control the charge applied to said toner.

5,183,965

CERAMIC SUPERCONDUCTING DOWNLEAD

William N. Lawless, c/o CeramPhysics, Inc. 921 Eastwind Dr., Ste. 110, Westerville, Ohio 43081

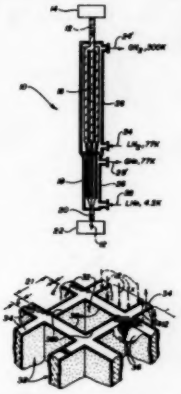
Filed Aug. 3, 1990, Ser. No. 562,222
Int. Cl.[5] H01B *12/00*; H04B *1/00*
U.S. Cl. 174—15.5 **48 Claims**

1. An electrical conductor for use as a downlead to devices operating at low temperatures comprising:

a ceramic honeycomb body having a plurality of longitudinal channels formed therethrough by longitudinal walls; and

at least one film of a ceramic superconductor material disposed on at least one surface of at least one of said longitudinal channels, said at least one film extending substantially the length of said one of said longitudinal channels;

wherein the materials of said ceramic honeycomb body and said ceramic superconductor material are different; and wherein the crystal lattice of said ceramic honeycomb body and the crystal lattice of said ceramic superconductor



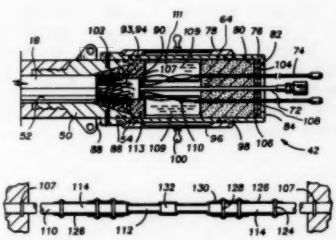
material substantially match, and at least portions of said respective crystal lattices are in substantial alignment.

5,183,966

TERMINATION ASSEMBLY WITH IMPROVED WATERBLOCK

Larry Hurtado, League City; Rick A. Curto, and Dallas Martin, both of Friendswood, all of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Nov. 19, 1990, Ser. No. 615,237
Int. Cl.[5] H02G *15/22*
U.S. Cl. 474—20 **15 Claims**



1. An apparatus for use in seismic surveying, comprising:

(a) a cable having a free end, a plurality of transmission lines and a stress member extending the length of the cable;

(b) a cable head having a first and second end, and a bore extending therebetween, said free end of the cable received by the first end of the cable head with the transmission lines extending from the second end of the cable head;

(c) potting means placed in the cable head for anchoring the stress member in the cable head;

(d) a sleeve coupled to the second end of the cable head for enclosing the plurality of transmission lines and distributing the transmission lines extending from the second end of the sleeve, said sleeve having an accessible chamber through at least one sealable port defined therein for providing access to the transmission lines; and

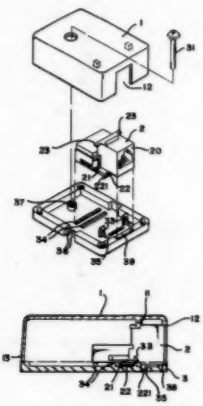
(e) means within the sleeve for preventing a fluid from entering the chamber.

5,183,967

JUNCTION BOX

Mao S. Lin, No. 165-1, Kuo Ching Road, Pan-Chiau, Taipei Hsien, Taiwan

Filed Oct. 16, 1991, Ser. No. 777,144
Int. Cl.[5] H05K *5/00*
U.S. Cl. 174—52.1 **3 Claims**



1. A junction box, comprising a cover covered on a base holding at least one adapter therein, wherein said cover comprises at least one pair of pressure rods, at least one wire hole for inserting an exchange line, and at least one front notch; said at least one adapter each comprises a retaining strip on the bottom edge thereof, a jack on the front end thereof retained in said at least one front notch for connecting a telephone line by a plug, two opposite projections at the top stopped by said at least one pair of pressure rods, and two side blocks at two opposite sides, said retaining strip having a bottom projection projecting from the bottom edge thereof; and said base comprises at least one pair of lugs stopped against said two side blocks at the front, at least one first groove into which said bottom projection on said retaining strip is inserted, at least one pair of stop bars for supporting said at least one adapter, said at least one pair of stop bars including a first stop bar stopped against said retaining strip at the back, and a second groove for holding said jack in position.

5,183,968

Patent Not Issued For This Number

5,183,969

ANISOTROPICALLY ELECTROCONDUCTIVE ADHESIVE AND ADHESIVELY BONDED STRUCTURE THEREWITH

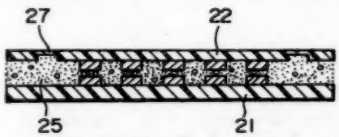
Satoshi Odashima, Saitama, Japan, assignor to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Oct. 1, 1991, Ser. No. 770,975
Claims priority, application Japan, Oct. 5, 1990, 2-268147
Int. Cl.[5] H05K *1/14*
U.S. Cl. 174—88 R **4 Claims**

1. An adhesively bonded structure of circuit boards formed by using an anisotropically electroconductive adhesive composition which comprises, as an integral body:

(A) two circuit boards each having an array of electrode terminals facing the other, one or both of the circuit boards having means for visual inspection of the electrode terminals; and

(B) a layer of an adhesive between the arrays of electrode terminals on the circuit boards as formed by curing an adhesive composition comprising, as a blend,



(a) an epoxy resin-based adhesive resin as a matrix containing a catalytic effective amount of a curing catalyst selected from the group consisting of polyamide-polyamine based compounds, aromatic polyamine compounds, imidazole compounds, tetrahydrophthalic anhydride, and which exhibits a change in color by curing, and

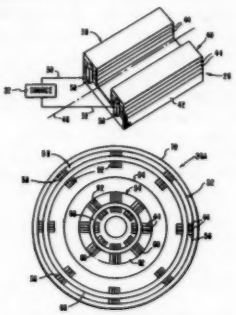
(b) electroconductive fine particles dispersed in the matrix.

5,183,970

ORIENTED SUPERCONDUCTORS FOR AC POWER TRANSMISSION

William J. Gallagher, Dobbs Ferry, and Thomas K. Worthington, New York, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 517,010, May 1, 1990, abandoned. This application Mar. 9, 1992, Ser. No. 847,841
Int. Cl.[5] H01B *12/00*
U.S. Cl. 174—125.1 **12 Claims**



12. A power transmission line comprising:

a plurality of electrically conductive elements, the elements being arranged along an axis oriented in a direction of power flow, each element comprising a superconductive material having anisotropic magnetic parameters and a crystalline structure formed about a basal crystallographic plane, the material in each element exhibiting superconductivity and a linear hysteresis-free magnetization characteristic in the presence of an applied magnetic field less than a lower critical field, the lower critical field having a maximum value in a direction perpendicular to the basal plane; and

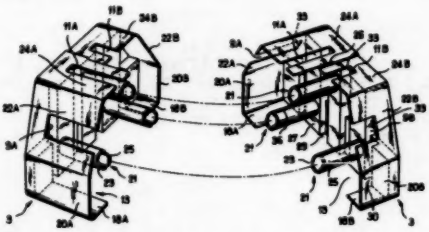
means for supporting said electrically conductive elements with their respective basal crystallographic planes extending radially outward from said axis, said supporting means holding a set of elements of said plurality of elements in an array to form a conductor of said transmission line.

5,183,971

PROTECTIVE CASING FOR ELECTRIC DISTRIBUTION BUSBARS

Jean Lafosse, Mirebeau sur Beze, and Paul Milliere, Varois et Chaignot, both of France, assignors to Telemecanique, Rueil-Malmaison, France

Filed Dec. 28, 1990, Ser. No. 633,172
Claims priority, application France, Dec. 28, 1989, 89 17345
Int. Cl.[5] H01B *17/24*
U.S. Cl. 174—138 F 24 Claims



20. A protective casing (1) for electric distribution busbars (7), constructed of insulating material and adapted to surround a region of an array of electric distribution busbars, said casing being made up of two identical half-casings (3) each provided on the periphery of an open face with recesses (9A, 9B, 11A, 11B, 13) which form entrance and exit passageways for the busbars (7) after coupling of the half-casings (3), wherein the two half-casings are coupled together by displacement in mutual sliding motion in a coupling direction substantially perpendicular to said array up to a mutual coupling position which is variable according to the dimension of the busbars parallel to the direction of sliding displacement, and wherein a coupling region of each half-casing comprises an external engagement region (18A, 20A, 22A, 24A) on one side of a median plane (P—P') and an internal engagement region (18B, 20B, 22B, 24B) on the other side of said median plane, the two engagement regions are separated by recessed regions (26, 13) through which the median plane (P—P') passes, the half-casings (3) being connected by screw attachment means (37) extending within at least one insulating sleeve between adjacent conductive busbars (7), and wherein the insulating sleeve comprises two identical elementary sleeves (21) each forming part of one of the half-casings (3), each elementary sleeve comprising at least one outer tongue (23) and an inner tongue (25) which is angularly displaced with respect to the outer tongue and adapted to slide within the outer tongue of the elementary sleeve of the other half-casing.

5,183,972

COPPER/EPOXY STRUCTURES

Diana C. Duane, Cedar Park, Tex.; Eric L. Zilley, St. Paul, Minn., and Robert C. Jordan, White Bear Lake, Minn., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex. and Minnesota Mining and Manufacturing Company, St. Paul, Minn.

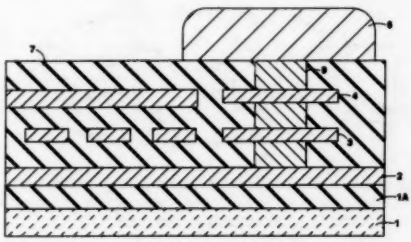
Filed Feb. 4, 1991, Ser. No. 650,137
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—251 22 Claims

1. A multilayer circuit comprising:

a substrate;

a first cured epoxy resin dielectric layer on said substrate wherein the thermal coefficient of expansion of said first cured epoxy resin dielectric layer and said substrate are matched;

at least two high density circuit pattern layers located above said first cured epoxy resin dielectric layer wherein said circuit pattern layers exhibit a conductor line density of greater than 300 lines per inch per level; and



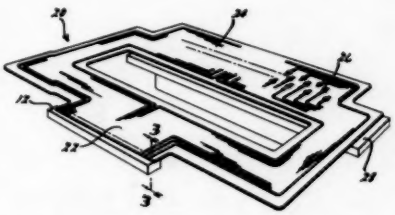
a second cured epoxy resin dielectric layer located between said circuit pattern layers.

5,183,973

FLEXIBLE CABLE FOR INTERCONNECTING ELECTRONIC COMPONENTS

Lloyd D. Ingle, Lompoc; Leonard E. Peck, Jr., and Jose A. Santana, both of Goleta, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 14, 1989, Ser. No. 394,049
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—254 18 Claims



1. A flexible cable comprising:

a) a thin, flexible insulative substrate having first and second opposing sides, said substrate formed of a polyimide H film having a thickness from 0.0003 to 0.020 inch;

b) a layer of inorganic material adhered to the first side of the substrate, said inorganic material for facilitating adhesion thereto of at least one gold conductor; and

c) at least one gold conductor adhered to the inorganic material.

5,183,974

GAS PULSATION ATTENUATOR FOR AUTOMOTIVE AIR CONDITIONING COMPRESSOR

Richard D. Wilhelm, Amherst, and Nikolaos A. Adonakis, Grand Island, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

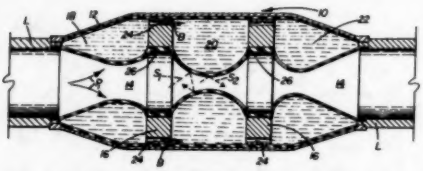
Filed Apr. 3, 1992, Ser. No. 862,706
Int. Cl.[5] F01N *1/00*
U.S. Cl. 181—0.5 4 Claims

1. An apparatus for attenuating refrigerant gas pressure and sound energy pulsations emanating from a piston-type refrigerant compressor, comprising:

an annular elastomeric, fluid-filled body defining a central refrigerant gas flow passage;

divider means for said fluid-filled body to form multiple chambers; and

damping track means extending through said divider means providing fluid communication between said chambers;



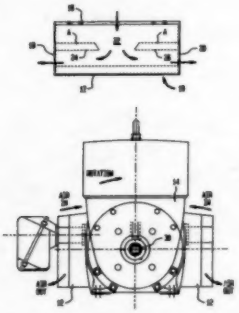
whereby said pressure and sound energy pulses are dampened to smooth and quiet the operation of the compressor by fluid flow between said chambers.

5,183,975

MUFFLER FOR A COOLING SYSTEM OF AN ELECTRIC MOTOR

Jack L. Craggs, and Robert R. Burke, both of Cincinnati, Ohio, assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed May 15, 1991, Ser. No. 700,300
Int. Cl.[5] H02K *5/24*
U.S. Cl. 181—202 **16 Claims**



1. A muffler for an air-cooling system used for channeling air for cooling heat-generating apparatus, the muffler comprising:

housing means mounted on the heat-generating apparatus and formed with air-inlet means, air-outlet means and air-passage means extending between and connecting the inlet means and the outlet means, whereby air from outside the housing means employed to cool the heat-generating apparatus enters the housing means through the inlet means, flows through the passage means and exits the housing means through the outlet means, noise having a spectrum of frequencies including a relatively low main discrete frequency, which corresponds to a relatively low wavelength, and a plurality of higher frequencies being generated in the cooling air during operation of the heat-generating apparatus and cooling system;

baffle means positioned within the housing means adjacent to the outlet means to interrupt lines of sight from the passage means to the outside of the housing means;

the housing means and the baffle means being made of a predetermined material having a predetermined mass, the material and mass being selected to attenuate direct egress of the higher frequencies of the noise spectrum to a substantial degree; and

a sound-absorbent material positioned on selected interior surfaces of the housing means and having an effective thickness equal to between approximately one-eighth and one-half of the wavelength of the relatively low main discrete frequency of the noise spectrum;

the inlet means, outlet means and air-passage means being of large cross section to enable cooling of the heat-generating apparatus using low air velocities at low back pressures; and

the inlet means and the outlet means being located relative to the heat-generating apparatus and directing exhaust air in such a manner to minimize recirculation of the air,

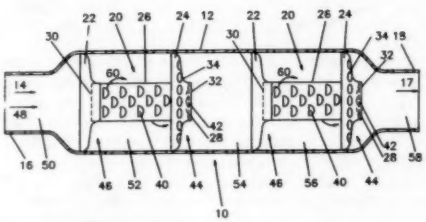
wherein the heat generating apparatus is an electric motor having a rotor and the cross section of the inlet means, outlet means and air-passage means being chosen so that the air velocity in the housing is less than 20% of peripheral speed of the rotor when the motor is in operation.

5,183,976

ADJUSTABLE SOUND ATTENUATING DEVICE

R. J. Plemons, Jr., 1126 Rockledge Rd., Attalla, Ala. 35954

Filed Nov. 26, 1991, Ser. No. 798,524
Int. Cl.[5] F01N *1/08*
U.S. Cl. 181—264 **20 Claims**



1. A muffler comprising:

an outer shell defining an elongated housing having a longitudinal axis and input and output ends;

a perforated tube disposed within said housing along said axis and having an input end and an output end spaced apart inwardly from said input and output end, respectively, of said housing, an annular chamber being defined between said tube and said housing;

a first baffle plate disposed within and transversely across said housing adjacent to the input end of said tube and defining an end chamber between the input end of said tube and said input housing end, said baffle providing a solid cover between said tube and said housing and having a central opening communicating said housing input end with said tube, whereby incoming gas will be channeled entirely into said tube; and

a second baffle plate disposed transversely across said housing adjacent to the output end of said tube, said second baffle plate having a plurality of apertures extending therethrough, whereby exhaust gas may be expelled from said annular chamber around the periphery of the housing.

5,183,977

MUFFLER ASSEMBLY OF INTERNAL COMBUSTION ENGINE

Yoshihiro Horitani, Hamamatsu, Japan, assignor to Suzuki Kabushiki Kaisha, Japan

Filed Mar. 8, 1991, Ser. No. 666,865
Claims priority, application Japan, Mar. 14, 1990, 2-61154
Int. Cl.[5] F01N *1/08*
U.S. Cl. 181—266 **20 Claims**

1. A muffler assembly of an internal combustion engine provided with an exhaust gas port, the muffler assembly being connected during use to one end of an exhaust pipe which has another end connected to the exhaust gas port of the engine, said muffler assembly comprising:

an inner casing in which is defined a first expansion chamber into which the one end of the exhaust pipe is inserted;

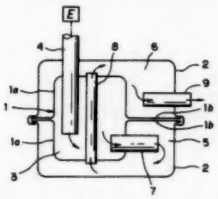
an outer casing disposed outside the inner casing so as to

define second and third expansion chambers between the inner and outer casing;

first baffle pipe means disposed so as to mutually communicate the first and second expansion chambers;

second baffle pipe means disposed so as to mutually communicate the second and third expansion chambers; and

tail pipe means disposed so as to communicate the third expansion chamber and an outside of the outer casing;



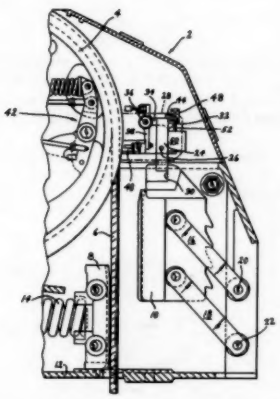
wherein exhaust gas from the exhaust gas port of the engine is first introduced into the first expansion chamber of the inner casing, then flows into the second and third expansion chambers in the outer casing through the first and second baffle pipe means, and is finally exhausted through the tail pipe means.

5,183,978

ELEVATOR GOVERNOR ROPE BLOCK ACTUATION IN LOW SPEED EMERGENCY SITUATIONS

William G. Sheridan, Southington, and Edward D. Reiskin, West Hartford, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Apr. 3, 1991, Ser. No. 679,873
Int. Cl.[5] B66B *5/00, 5/02*
U.S. Cl. 187—105 **4 Claims**



1. In an elevator system, an elevator governor rope emergency brake assembly for stopping governor rope movement upon the occurrence of a low speed emergency condition in an elevator car, said assembly comprising:

a) a governor sheave over which the governor rope passes;

b) block means adjacent to the governor sheave for selectively engaging and braking the governor rope against movement;

c) latch means for holding said block means in a brake-off condition;

d) release means for disabling said latch means to set said block means on the governor rope;

e) mechanical means on said governor sheave for actuating said release means in the event of governor sheave overspeed;

f) a solenoid tripper adjacent to said release means for selectively directly contacting and actuating said release means upon detection of said low speed emergency condition, said solenoid tripper being passive at all times other than upon detection of said emergency condition; and

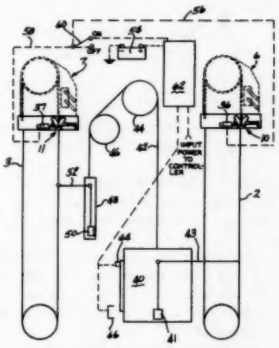
g) controller means for controlling operation of the elevator, said controller means being connected to said solenoid tripper and operable to activate the latter only upon detection of said emergency condition.

5,183,979

ELEVATOR GOVERNOR ROPE RESTRAINT WHEN ELEVATOR CAR MOVES WITH CAR DOORS OPEN

William G. Sheridan, Southington, Conn., and Edward D. Reiskin, New York, N.Y., assignors to Otis Elevator Company, Farmington, Conn.

Filed Jul. 22, 1991, Ser. No. 733,510
Int. Cl.[5] B66B *5/02*
U.S. Cl. 187—108 **1 Claim**



1. An elevator safety system for stopping movement of an elevator governor rope upon movement of an elevator cab away from a landing with the cab doors open, said system comprising:

a) first means for detecting the position of the cab relative to the landings;

b) second means for detecting the position of the cab doors;

c) controller means connected to said first and second means for receiving signals from the latter, said controller means being operable to emit a stop signal when door-open cab movement away from a loading is detected;

d) jaw means straddling said governor rope and movable between a rope-grasping position and a rope-free position, said jaw means comprising a pair of pivotal jaws, one of which is disposed on each side of said governor rope; spring means biasing one of said jaws toward the other; said jaws including intermeshed toothed portions for providing coordinated closing movement of said jaws onto the governor rope;

e) catch means for engaging the other of said jaws to hold said jaw means in said rope-free position whereby said governor rope is free to move unimpededly between said jaw means; and

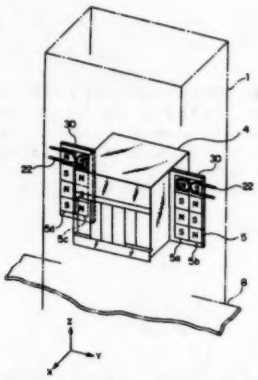
f) means connected to said controller means for disabling said catch means in response to said stop signal whereby said jaws automatically move to said rope-grasping position to stop further movement of the governor rope.

5,183,980

LINEAR MOTOR ELEVATOR DEVICE WITH A NULL-FLUX POSITION ADJUSTMENT

Shigeru Okuma; Takeshi Furuhashi, both of Nagoya; Hiroyuki Ikejima, and Toshiaki Ishii, both of Inazawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1991, Ser. No. 707,342
Claims priority, application Japan, Jun. 1, 1990, 2-143537
Int. Cl.[5] B66B *1/06*
U.S. Cl. 187—112 **4 Claims**



1. A linear motor elevator device for hoisting a hoisted body up and down within a hoist way by means of a linear motor, comprising:

primary side coils of a linear motor mounted on a side wall of said hoist way along a hoist path of the hoisted body, the primary side coils generating a magnetic field moving along the hoist way; and

secondary side magnets of the linear motor attached to a side of said hoisted body to oppose said primary side coils across a gap, whereby said moving magnetic field generated by the primary side coils drive said hoisted body within the hoist way;

wherein upon displacement of the hoisted body along a direction perpendicular to a hoisting direction of the hoisted body a circulating current which counterbalances a variation of magnetic flux caused by the displacement of the hoisted body flows through said primary side coils, thereby automatically adjusting a position of the hoisted body along said direction perpendicular to the driving direction.

5,183,981

"UP-PEAK"0 ELEVATOR CHANNELING SYSTEM WITH OPTIMIZED PREFERENTIAL SERVICE TO HIGH INTENSITY TRAFFIC FLOORS

Kandasamy Thangavelu, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation-in-part of Ser. No. 318,295, Mar. 3, 1989, which is a continuation-in-part of Ser. No. 209,744, Jun. 21, 1988, Pat. No. 4,838,384. This application Mar. 2, 1990, Ser. No. 487,344
Int. Cl.[5] B66B *1/20*
U.S. Cl. 187—128 **8 Claims**

1. In an elevator dispatching system controlling the assignment of elevator cars in a building having a lobby and a plurality of floors above the lobby, a method of grouping contiguous floors into sectors, said method comprising the steps of:

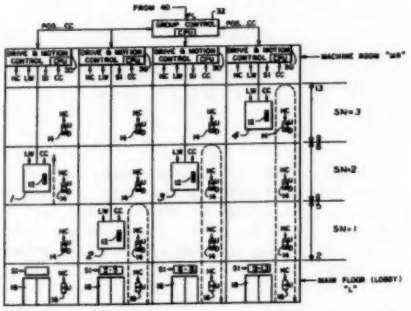
obtaining information on the number of passengers arriving at each floor above the lobby from elevator cars traveling in an UP-direction, said information covering at least a predetermined time interval;

predicting, for a subsequent predetermined time interval, the number of passengers to be arriving at each of the floors above the lobby from elevator cars traveling in the UP-direction based on said obtained information;

determining the number of sectors to be formed based on the number of elevator cars;

determining average traffic per sector based on said predicted passenger arrival count and said determined number of sectors; and

starting from the first floor above the lobby and continuing through to the top floor in the building, selecting a set of contiguous floors for each sector such that the predicted traffic for each sector is less than a predetermined threshold, wherein



if the predicted traffic for a selectable next contiguous floor, added to the predicted traffic for all contiguous floors already selected for the sector, is less than the predetermined threshold, include said selectable floor in the sector,

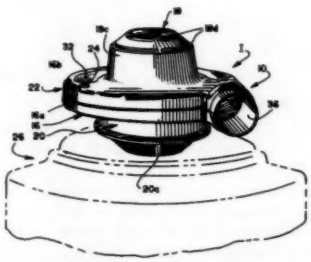
otherwise, begin another sector with said selectable floor as the bottom floor in the other sector.

5,183,982

MANUALLY ADJUSTABLE HOUSING PORTIONS FOR ACTUATING AN ELECTRICAL APPLIANCE SWITCH

James F. Smith, Louisville, and Wesley A. Schroeder, Uniontown, both of Ohio, assignors to GMI Holdings, Inc., Alliance, Ohio

Filed Sep. 26, 1990, Ser. No. 588,374
Int. Cl.[5] H01H *9/06*
U.S. Cl. 200—61.85 **9 Claims**



1. An electrical appliance operable in various modes, comprising:

a housing having first and second exterior surface portions;

switch means disposed within the housing for opening and closing an electrical circuit for the appliance; and

manually adjustable control means operatively connected to said switch means for selective manual adjustment between first and second positions to effect opening and

closing said electrical circuit; said control means having a unitary control member with first and second exposed surfaces in angularly disposed relation, said first surface overlying said first exterior portion of said housing and being oriented for selective manual adjustment between said first and second positions when said appliance is in a first operating mode and said second surface overlying said second exterior portion of said housing and being oriented for selective manual adjustment between said first and second positions when said appliance is in a second operating mode.

5,183,983

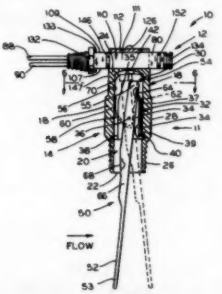
FLOW SWITCH ASSEMBLY FOR FLUID FLOW MONITORING

David G. Knop, Chesterton, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Mar. 20, 1992, Ser. No. 855,213

Int. Cl.[5] H01H *35/40*

U.S. Cl. 200—81.9 M **7 Claims**



1. In a fluid flow monitoring assembly that includes an elongate sensing body adapted for crosswise application at one end thereof to and into a conduit through which the fluid to be monitored is to flow, with the sensing body being formed from non-magnetic material to define a bore extending longitudinally thereof that is open at one end thereof and that is closed at the other end thereof, and with the sensing body cross mounting at its closed end an elongate reed type off-on switch device for adjustment movement longitudinally laterally of the body between Normally Closed (NC) and Normally Open (NO) switching function positions, and with the sensing body pivotally mounting in its bore, for pivot movement in a plane that is in substantial coplanar relation to the direction of fluid flow through the conduit, a vane assembly that includes at one end of same a vane projecting from the body open end and a permanent magnet adjacent the other end of the vane assembly disposed adjacent the sensing body closed end for effecting by magnetic action the activation of the switch device to its desired switching function position, spring means mounted within the sensing body for resiliently opposing such pivotal action of the vane assembly, and means for clamping the switch device into fixed relation with the sensing body,

the improvement wherein:

the switch device comprises an elongate housing defining an elongated bore intermediate the ends thereof, a reed switch mounted in said housing bore in electrical circuit arrangement with lead wires extending from one of end of said housing, with said reed switch being disposed on the side of said housing that has a level that is closest to the path movement of the magnet on pivotal movement of the vane assembly, said side of said housing being the switch side of said housing,

said housing defining first and second stop means disposed one on either side of the sensing body for physical engagement with the sensing body, respectively, when the switch device is to be positioned to indicate the Normally Closed and Normally Open switch function positions of said reed switch, respectively,

with said reed switch being positioned longitudinally in said housing to have its Normally Closed function when said housing first stop means engages the sensing body,

and with said housing have the side of same opposite that of said switch side bearing indicia corresponding to the location of said first and second stop means.

5,183,984

COOKING APPARATUS WITH COOKING INFORMATION DISPLAY MEANS

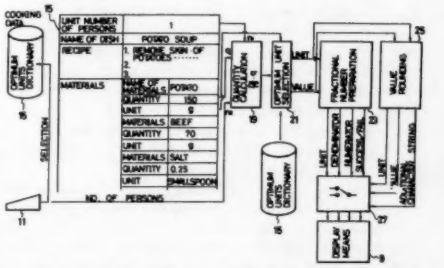
Tatsuya Nakagawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 299,374, Jan. 23, 1989, abandoned. This application Feb. 24, 1992, Ser. No. 841,260

Claims priority, application Japan, Jan. 21, 1988, 63-9683; Jan. 21, 1988, 63-9684; Jan. 21, 1988, 63-9685

Int. Cl.[5] H05B *6/68*

U.S. Cl. 219—10.55 M **4 Claims**



1. A method of displaying suitable quantities of materials necessary for preparing each dish to be cooked in a cooking apparatus, comprising a control system for processing data for said dish and a display device for displaying information derived from the data, said method comprising the steps of:

(a) calculating quantities of materials necessary for preparing the dish for an indicated number of persons in accordance with the quantities of materials per person stored in a cooking information storage means of the cooking apparatus;

(b) converting the calculated quantities of the materials associated with a first unit to equivalent quantities represented by fewer effective digits associated with a second unit different than said first unit as a first display information;

(c) separating a decimal portion of the first display information from an integral portion, converting the decimal portion to a proper fraction, and adding the fraction to the integral portion to obtain second display information;

(d) dropping the digits of said first display information expressed in the decimal number system to obtain third display information; and

(e) selecting one of the first, second, and third display information and displaying on a display the selected display information, said steps (b), (c), (d) and (e) being performed by said control system.

5,183,985

CONTACTLESS HEATING FREQUENCY HEATING OF THIN FILAMENTS

Paulette S. Sidky, and Michael G. Hocking, both of Surrey, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

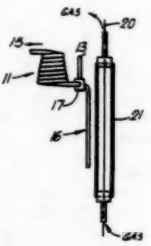
PCT No. PCT/GB89/00505, § 371 Date Dec. 27, 1990, § 102(e) Date Dec. 27, 1990, PCT Pub. No. WO89/11770, PCT Pub. Date Nov. 30, 1989

PCT Filed May 11, 1989, Ser. No. 623,808

Claims priority, application United Kingdom, May 19, 1988, 8811893

Int. Cl.[5] H05B *6/10*

U.S. Cl. 219—10.61 R **17 Claims**



1. A contactless heating apparatus for thin filaments, including a length of filament, said apparatus comprising:

a source of alternating current in the frequency range from HF to UHF;

means for supporting said length of filament;

a tuned induction circuit connected to the output of the source of alternating current, the induction circuit including an induction coil having a plurality of turns extending along a longitudinal axis arranged such that said coil is located adjacent to the filament and said longitudinal axis is parallel to the filament; and

a substantially linear conducting inductor element having one free end and the other end thereof connected to one turn of the induction coil such that said inductor element is disposed substantially parallel to the filament, wherein heating of the filament occurs adjacent to the conducting inductor element.

5,183,986

WIRE-TYPE ELECTRIC DISCHARGE MACHINING SYSTEM CAPABLE MAGNETICALLY OF COLLECTING MATERIAL THAT HAS BEEN REMOVED FROM A WORKPIECE AND CONFIRMING THE MAGNETIC ATTRACTION

Takuji Magara, and Masahiro Yamamoto, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Oct. 8, 1991, Ser. No. 772,797

Claims priority, application Japan, Oct. 8, 1990, 2-269902; Mar. 8, 1991, 3-43062

Int. Cl.[5] B23H *7/02, 11/00*

U.S. Cl. 219—69.12 **13 Claims**

1. A wire-type electric discharge machining system comprising:

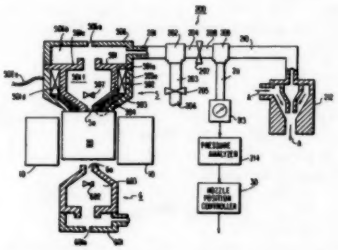
an electromagnet operable to attract a material cut from a workpiece during a machining operation;

an air hole movable in concert with said electromagnet relative to said workpiece, so that said air hole is obstructed when said material is attracted to said electromagnet;

a vacuum device for providing a flow of air through said air hole;

a pressure measuring device for measuring pressure in said vacuum device, said vacuum device tending to reduce pressure within itself;

first pressure determining means for determining whether said material is attracted to said electromagnet based upon the result of measurement taken by said pressure measuring device; and



first transfer control means for predeterminately moving said electromagnet relative to said workpiece based on the result of determination of said first pressure determining means.

5,183,987

CUT-OUT PIECE REMOVING METHOD IN ELECTRIC DISCHARGE MACHINING AND AN APPARATUS THEREFOR

Toshiyuki Aso, and Shinji Yoda, both of Yamanashi, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

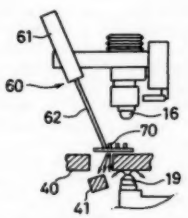
PCT No. PCT/JP91/00455, § 371 Date Dec. 5, 1991, § 102(e) Date Dec. 5, 1991, PCT Pub. No. WO91/15324, PCT Pub. Date Oct. 17, 1991

PCT Filed Apr. 5, 1991, Ser. No. 777,526

Claims priority, application Japan, Apr. 5, 1990, 2-89039

Int. Cl.[5] B23H *7/02, 11/00*

U.S. Cl. 219—69.12 **7 Claims**



1. A cut-out piece removing method in electric discharge machining in which a piece is cut out from a workpiece, comprising the steps of:

(a) upwardly jetting fluid toward a bottom surface of the piece cut out of the workpiece; and

(b) horizontally moving the cut-out piece in unison with the workpiece while jetting the fluid;

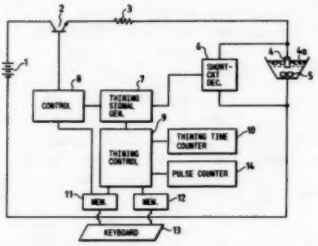
wherein the cut-out piece is permitted to naturally drop from the workpiece when the cut-out piece reaches a horizontal moved position at which the jetted fluid no longer acts thereon.

5,183,988

ELECTRIC DISCHARGE MACHINING METHOD

Hiroshi Takeuchi; Tomoko Sendai, and Yozo Sakai, all of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 514,644
Claims priority, application Japan, Apr. 24, 1989, 1-103952
Int. Cl.[5] B32H *1/02, 7/16, 7/20*
U.S. Cl. 219—69.17 7 Claims



1. An electric discharge machining method in which an electric discharge is generated in a gap between an electrode and a workpiece by applying a pulse voltage across the gap to thereby machine said workpiece, the gap being filled with a machining solution, comprising the steps of:

selecting a condition which tends to place the gap between said electrode and workpiece in an unstable state for machining said workpiece;

setting a period of time for which the condition selected lasts; and

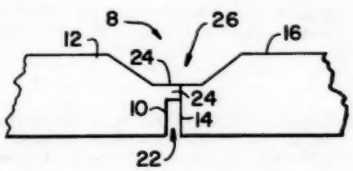
reducing the discharge energy provided by the pulse voltage for the period of time thus set when the condition is detected.

5,183,989

REDUCED HEAT INPUT KEYHOLE WELDING THROUGH IMPROVED JOINT DESIGN

John M. Sanders, and Dennis D. Harwig, both of Canton, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 17, 1991, Ser. No. 716,195
Int. Cl.[5] B23K *15/00*
U.S. Cl. 219—121.14 5 Claims



1. In a keyhole welding mode of a high energy density welding process employing a high velocity gas jet to maintain a molten keyhole through a joint thickness, the improvement comprising the steps of:

providing a projecting portion having a predetermined dimension on one edge of a member; and

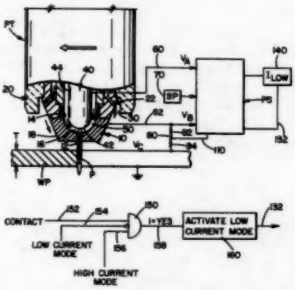
abutting the projecting portion tightly against an even edge of another member to provide a controllable gap greater than or equal to about 0.030 inch for maintaining a controlled distance to enhance the keyhole welding mode by controlling the gap as deposited weld metal shrinks to increase penetrating ability of the jet, the controlled distance between the edges of the member being a slot defined by a predetermined width extending between the edges of the member up to the projecting portion.

5,183,990

METHOD AND CIRCUIT FOR PROTECTING PLASMA NOZZLE

Edward A. Enyedy, Eastlake, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed Apr. 12, 1991, Ser. No. 684,331
Int. Cl.[5] B23K *10/00*
U.S. Cl. 219—121.54 37 Claims



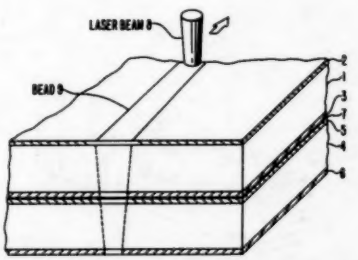
1. A system for protecting the nozzle of a plasma torch comprising a nozzle with a plasma outlet opening and an internal electrode chamber and an elongated electrode in said chamber and spaced from said nozzle a distance defining an annular gas passage means for allowing flow of a gas through said passage means and through said outlet for impingement against a workpiece below said outlet as an electrical power supply maintains an arc current to said electrode for sustaining said plasma from said nozzle to said workpiece, said system comprising: current control means for selectively shifting said power supply between a first high arc current mode and a second low arc current mode greater than zero, means for detecting contact of said nozzle with said workpiece and means responsive to said detection for holding said current control means in said second mode as long as said contact is detected.

5,183,991

METHOD OF WELDING GALVANIZED STEEL SHEETS WITH A LASER BEAM

Takeji Arai, Iruma, Japan, assignor to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP90/01464, § 371 Date Jul. 15, 1991, § 102(e) Date Jul. 15, 1991, PCT Pub. No. WO91/07250, PCT Pub. Date May 30, 1991
PCT Filed Nov. 9, 1990, Ser. No. 720,848
Claims priority, application Japan, Nov. 22, 1989, 1-304328
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.64 6 Claims



1. A method of welding a first galvanized steel sheet to a second galvanized steel sheet or to a sheet of another metal with a laser beam, said method comprising the steps of:

forming an intermediate layer for suppressing evaporation of zinc over a zinc layer of said first galvanized steel sheet, and arranging the sheets to be welded in a welding position with said intermediate layer disposed between said galvanized steel sheets or between said galvanized steel sheet and said sheet of another metal; and

applying a laser beam to the sheets in said welding position, to thereby weld the sheets together with the laser beam.

5,183,992

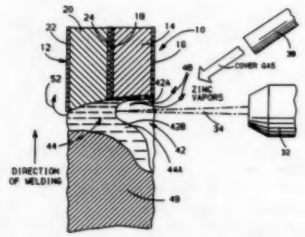
LASER WELDING METHOD

Umit Bilge, Mt. Clemens; Christopher E. Jurczyszyn, Livonia, and William C. Jenuwine, Marine City, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1991, Ser. No. 750,837

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.64 **4 Claims**



1. A method of laser lap welding two sheets of steel which have coatings of zinc on opposed sides thereof, the steps comprising, positioning said sheets in a generally vertical position and holding said sheets engaged, directing a laser beam against an outer surface of one of said sheets, and then moving said sheets and laser beam relative to each other in a vertical direction such that said laser beam melts the material of said sheets progressively in a vertical upward direction to create a cavity and such that melted molten material of said sheets flows vertically downwardly by gravity to thereby facilitate the escape of zinc: vapors caused by vaporization of said zinc by said laser beam.

5,183,993

LASER BEAM MACHINING SYSTEM AND LASER BEAM MACHINE COVER

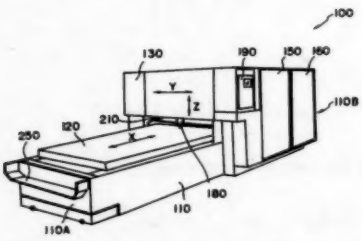
Takeshi Sato; Minoru Tashiro, and Naoomi Miyakawa, all of Aichi, Japan, assignors to Yamazaki Mazak Corporation, Japan

Filed Jun. 12, 1991, Ser. No. 713,847

Claims priority, application Japan, Jun. 19, 1990, 2-64036[U]

Int. Cl.[5] B23K *26/02*

U.S. Cl. 219—121.82 **9 Claims**



1. A laser beam machining system comprising:

a laser beam machine having:

a base,

a gate shaped column provided above said base,

a table driven underneath said column in an X-axis direction which is the longitudinal direction of said base,

a machining head supported by said column and driven in a Y-axis direction which crosses at a right angle with said X-axis, and

a cover for covering said table, said cover being slidable over an upper face of said table whereby said cover assumes an open position underneath said column;

a rail provided above said table; and

a conveying robot which runs along said rail.

5,183,994

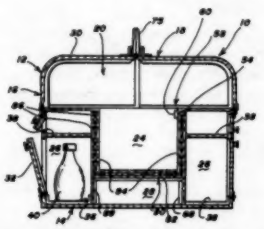
HEATED DRUG BOX

Dale D. Bowles, Sr., 2443 Hemlock Ave., and Charles L. Parmley, 23 Kelley, both of Granite City, Ill. 62040

Filed Oct. 26, 1990, Ser. No. 605,114

Int. Cl.[5] H05B *3/00*

U.S. Cl. 219—387 **6 Claims**



1. A heated drug box for transporting drugs and I. V. solutions at a safe working temperature comprising an insulated case having a bottom, sidewalls and a top enclosing an interior space partitioned into a main compartment, a pair of side compartments and a bottom compartment, said compartments being in thermal contact with each other but being separated by physical barriers, said side compartments bordering the main compartment and said main compartment positioned over and bordering the bottom compartment, said compartments being in thermal contact with a heater means connected to a power source under control of a temperature control means, said main compartment being accessible through a first door means in the top, each of said side compartments being accessible through a second door means in the sidewalls and sized for storage of I. V. solution containers and said third compartment being accessible through a third door means in the sidewalls.

5,183,995

HEAT REDUCTION LIQUID VOLUME COMPENSATOR

F. Clark Addison, 3804 W. Eisenhower Ave., Loveland, Colo. 80537, and Peder J. Thorstensen, P.O. Box 1025, Loveland, Colo. 80539

Filed Nov. 7, 1991, Ser. No. 789,047

Int. Cl.[5] H05B *3/72*

U.S. Cl. 219—433 **12 Claims**

1. A heat reduction liquid volume compensator comprising:

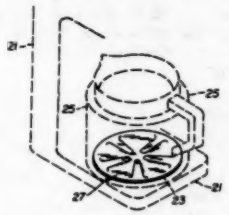
a body adapted to seat over a heat source and carry the weight of a fluid container,

said body having a plurality of circumferentially spaced resilient segments, each said segment having an attached end and a free end,

said body defining two oppositely facing contact surface portions disposed in substantially parallel spaced planes in an extended position, at least one of said planes being defined by said free ends, and

said contact surface portions being movable in relation to each other, the spacing between said contact surface por-

tions decreasing in response to the weight of said container, and the resilience of said segments causing said contact surface portions to return automatically to said extended position when said weight is removed, the resilience of the segments being sufficient to cause the spacing between said contact surface portions to increase sufficiently to result in a reduction of heat applied to said container by said heat source as the amount of liquid in said container is reduced.

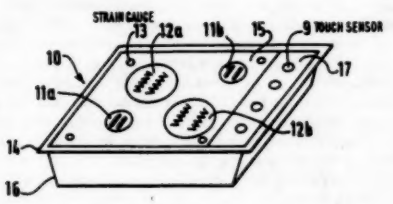


5,183,996

COOK-TOP

Jean-Pierre Hazan, Sucy-En-Brie; Rémy Polaert, Villecresnes, and Gilles Delmas, Epinany-Sous-Senart, all of France, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jul. 1, 1991, Ser. No. 724,243
Claims priority, application France, Jul. 6, 1990, 90 08597
Int. Cl.[5] H05B *3/74*
U.S. Cl. 219—452 **14 Claims**



1. A cook-top (**10**) comprising a plurality of heating elements (**11***a*, **12***a*) activated by function controls, wherein the heating elements are covered by a plate (**15**) which is fixedly connected to strain-gauge modules (**30**) which detect forces exerted on the plate by loads placed above the heating elements, control means (**70**, **75**, **76**) identifying such a heating element whose load has been subject to a variation, by computing the center of gravity of said forces, and influencing its electric power supply.

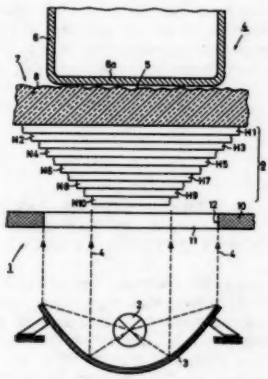
5,183,997

HEATING APPARATUS FOR COOKING FOOD, ESPECIALLY A HOT PLATE

Hans-Georg Lotz, Grüindau, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany

PCT No. PCT/EP90/00428, § 371 Date Sep. 18, 1991, § 102(e) Date Sep. 18, 1991, PCT Pub. No. WO90/11671, PCT Pub. Date Oct. 4, 1990
PCT Filed Mar. 21, 1989, Ser. No. 762,012
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909246
Int. Cl.[5] H05B *3/74*
U.S. Cl. 219—464 **12 Claims**

1. Heating apparatus for cooking foods comprising at least one radiation source directed at a cook site for accommodating food to be cooked or a container for food to be cooked, said source emitting optical radiation with a visible content and an infrared content, a filter with a support body made of a material substantially transparent to the radiation, said filter being disposed between the radiation source and the cook site and provided with an interference layer system which reflects the visible content of the radiation at least predominantly to the radiation source and passes the infrared content of the radiation at least predominantly to the cook site, wherein the interference layer system comprises an alternating series of layers of silicon (H) and silicon dioxide (N) whose physical layer thicknesses in the case of the silicon is between 20 and 50 nm, and in the case of the SiO_2 between 80 and 110 nm.

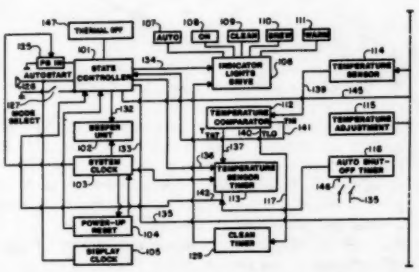


5,183,998

APPARATUS AND METHOD FOR HEATING WATER FOR INFUSION AND THE LIKE

Ronald J. Hoffman, Solon; Lawrence M. Pillion, University Heig, and Paul L. Jewell, Northfield Cent, all of Ohio, assignors to Mr. Coffee Inc.

Filed May 30, 1990, Ser. No. 529,900
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—492 **55 Claims**



1. Apparatus for heating water for infusing coffee or the like, said apparatus comprising:

heating means supplied by an A.C. power source;

power control means for connecting said A.C. power source to said heating means;

high power means for causing said power control means to apply full A.C. power to said heating means when a high power is required for the operation of said apparatus;

low power means for causing said power control means to apply a portion of subsequent AC cycles to said heating

means when a lower power is required, said low power means comprising phase delay means for limiting the application of A.C. power to the portion of subsequent A.C. cycles; and

said power control means including triac means for receiving a control signal from either the high power means or the low power means for applying A.C. power from an A.C. power source to said heater means; and

trigger means having inputs operatively connected to said high power means and to said low power means and whose output is operatively connected to the gate of said triac means, said trigger means generating a current spike for enabling said triac means during each half of an A.C. voltage cycle.

5,183,999

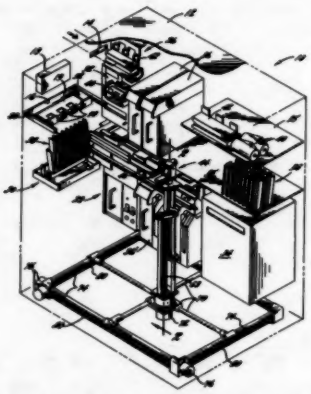
SELF-SERVICE TRANSACTION APPARATUS AND METHOD USING A ROBOT FOR ARTICLE TRANSPORT AND REPAIR OF INTERNAL ARTICLE HANDLING DEVICES

Paul A. Hakenewerth, Charlotte; Gene D. Rohrer, Concord, both of N.C., and Nils G. Stalberg, Lidingo, Sweden, assignors to International Business Machines, Armonk, N.Y.

Continuation of Ser. No. 335,067, Apr. 7, 1989, Pat. No. 5,105,069. This application Dec. 20, 1991, Ser. No. 811,415

Int. Cl.[5] G06F *15/30, 7/08;* **B25J** *11/00;* **E01B** *7/00*

U.S. Cl. 235—379 **8 Claims**



1. A self-service transaction apparatus for articles comprising:

a housing having an access port for permitting the passage of said articles between the interior of said housing and a user of said self-service transaction apparatus;

a plurality of article handling devices each mounted at a predetermined position within said housing for handling articles passed through said access port;

storage means mounted in said housing for storing a plurality of replacement handling devices;

a multi-purpose robot mounted in said housing, said robot having an article gripper including a pair of cooperating gripper jaws; and

control means mounted in said housing and connected to said robot for controlling said robot to transport at least one of said articles between said access port and at least one of said handling devices and to replace one of said handling devices at one of said predetermined positions with one of said replacement devices at said storing means.

5,184,000

AUTOMATIC CASH HANDLING SYSTEM OFFERING OPTIONAL PRINTED RECORD

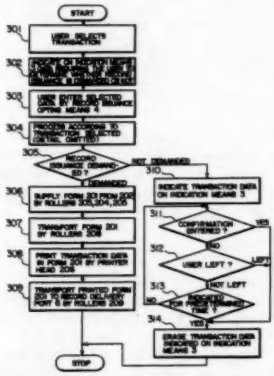
Yasunori Hamada, Tsuchiura; Junichi Oizumi, Ibaraki; Kousuke Noda, Tsuchiura, and Kunio Ushijima, Seto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1988, Ser. No. 269,607

Claims priority, application Japan, Nov. 13, 1987, 62-285383

Int. Cl.[5] G06F *15/30, 3/12, 3/14*

U.S. Cl. 235—379 **5 Claims**



1. An automatic cash handling system for handling cash transactions with the user by use of a privately-held cash card, comprising:

means for issuing a record such as a transaction statement;

record issuance opting means for allowing the user to indicate whether the user demands record issuance before the cash handling system starts executing a processing in accordance with a transaction designated by the user;

indication means for indicating transaction data when the cash handling system starts the processing and the user relinquishes the demand for record issuance;

input means for allowing the user to enter confirmation data for confirming the transaction data indicated on the indication means;

function selecting means for selectively enabling or disabling said record issuance opting means; and

control means for controlling said issuing means, said record issuance opting means, said indication means, said input means and said function selecting means.

5,184,001

SYSTEM FOR REMOTE INFORMATION INTERCHANGE BETWEEN A PORTABLE OBJECT AND A STATION

Philippe Levionnais, Caen, France, assignor to Etat Francais, Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications), Issy-les-Moulineaux, France

Continuation of Ser. No. 452,633, Dec. 18, 1989, Pat. No. 5,083,013. This application Jul. 11, 1991, Ser. No. 728,639

Claims priority, application France, Dec. 16, 1988, 88 16672

The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.

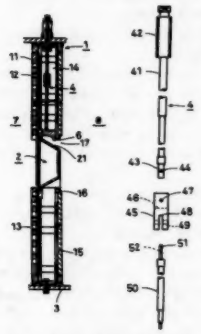
Int. Cl.[5] G06K *7/08*

U.S. Cl. 235—449 **10 Claims**

1. A station for use with a portable object inductively coupled thereto, comprising:

an oscillator including a feedback loop having a station inductor element therein and suitable for conferring a working frequency thereto which is variable relative to a rest frequency; a station processor means connected to the

oscillator and capable of processing variations in the working frequency; said oscillator having characteristics such that, when the portable object becomes inductively



coupled to the station inductor element, variations will be produced in the working frequency of the oscillator capable of being processed by the station processor means.

5,184,002

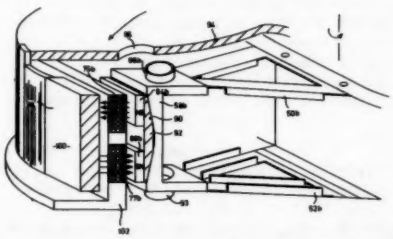
OPTICAL SCANNER

Ching Chu, Mississauga, Canada, assignor to Optical Recording Corporation, Toronto, Canada

Continuation of Ser. No. 440,695, Nov. 24, 1989, abandoned. This application Jul. 26, 1991, Ser. No. 735,669

Int. Cl.[5] G06K *7/10, 7/14, 7/00;* **G11B** *7/00*

U.S. Cl. 235—454 **31 Claims**



1. An optical scanner having a stationary housing, a scanner assembly continuously rotatable in said housing about an axis of rotation and having a plurality of mounting members uniformly distributed about the axis of rotation and each carrying an optical element at a location spaced from the rotational axis of said assembly to cause each said optical element to move in a circular path relative to the housing and pass periodically across and scan a record, each of said mounting members being flexible to permit movement of the respective optical element in a direction parallel to the axis of rotation, and electromagnetic drive means including a coil secured to said stationary housing and, when energized, to produce an electromagnetic field in said coil by regulating current flowing through said coil, said electromagnetic field operable upon respective ones of said mounting members to control flexure of said respective ones of said mounting members as the optical element associated therewith passes over said record to thereby focus a light beam on said record.

5,184,003

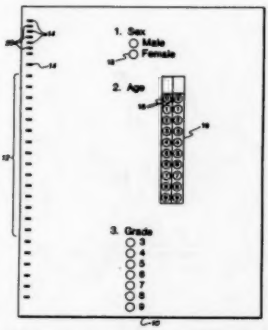
SCANNABLE FORM HAVING A CONTROL MARK COLUMN WITH ENCODED DATA MARKS

John V. McMillin, Iowa City, and Jay V. Clark, West Liberty, both of Iowa, assignors to National Computer Systems, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 444,869, Dec. 4, 1989, abandoned. This application Jan. 24, 1992, Ser. No. 826,264

Int. Cl.[5] G06K *7/14;* **G09B** *7/00*

U.S. Cl. 235—454 **22 Claims**



1. A scannable form for use in an optical mark reading system with optical sensing means of the type wherein sensing the presence or absence of response marks placed by a respondent in predetermined response areas on the form is triggered by sensing of a sequence of scan control marks associated with the predetermined response areas, comprising:

a generally rectangular sheet of material;

at least one column of control marks located on said sheet and oriented substantially parallel with an edge of said rectangular sheet comprising a plurality of spaced scan control marks defining data mark areas located between adjacent scan control marks nd aligned within the column of control marks;

at least one response area on said sheet associated with one of said scan control marks comprising a plurality of response bubbles in a specified rotation with said scan control mark; and

a plurality of data marks located on said sheet in said data mark areas aligned within the control mark column, said data marks comprising optically scannable marks that represent encoded data information that is known or determined prior to a respondent completing said scannable form by marking one or more of said response bubbles, such that said data marks will be scanned and decoded by the optical mark reading system during the scanning of said control mark column.

5,184,004

OPTICAL CODE READER

Shuji Ueda, Neyagawa, and Shoro Mochida, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 27, 1989, Ser. No. 344,089

Claims priority, application Japan, Apr. 28, 1988, 63-106320

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—462 **4 Claims**

1. An optical code reader comprising:

an optical member having

a transparent cylindrical member,

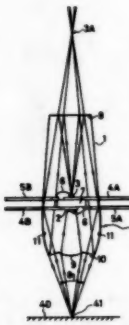
a flat mirror formed on one end face of said transparent cylindrical member, having a reflection surface which faces toward an inside of said transparent cylindrical member,

a convex lens for converging light reflected from a code to be read, formed on a central portion of the other end face of said transparent cylindrical member which in operation is adapted to face said code to be read,

a ring-shaped transparent portion located surrounding said convex lens at an outer peripheral portion of said convex lens,

a light interrupting plate attached to said cylindrical member,

a light emitting device for emitting light toward said flat mirror and away from said code, mounted interior to said transparent cylindrical member on a first surface of said plate,



an elliptical mirror formed on a side face of said transparent cylindrical member having a reflection surface facing an inside of said member and located to have a focal point where said code is adapted to be located,

said elliptical mirror receiving light from said light emitting device, reflected by said flat mirror, and converging said light to said focal point through said transparent portion, and

a light receiving device placed behind said light emitting device, on the other surface of said plate, said light receiving device mounted on the interior of said transparent cylindrical member and facing said other end face, for receiving light reflected by said code through said convex lens.

5,184,005

NON-DECODED TYPE BAR CODE READING APPARATUS

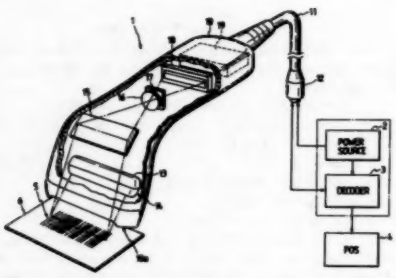
Naoki Ukai, Okazaki, and Koji Mori, Oobu, both of Japan, assignors to Nippondenso Co. Ltd., Kariya, Japan

Filed Jan. 7, 1991, Ser. No. 637,706

Claims priority, application Japan, Jan. 8, 1990, 2-2077

Int. Cl.[5] G06K *7/10*

U.S. Cl. 235—472 **19 Claims**



1. A bar code reading apparatus for optically reading a bar code to output as bar code information a digital signal indicating widths of successively alternately arranged bars and spaces of said bar code with its high-level durations and low-level separations to a decoder for decoding said digital signal indicative of said bar code information, said apparatus comprising:

a hand-operable housing;

producing means for producing an image of said bar code within said housing;

sensor means encased in said housing and equipped with a plurality of picture elements one-dimensionally arranged, for converting said image of said bar code into an electric signal at every picture element and for successively outputting said electric signals corresponding to said bar code;

signal processing means provided in said housing for smoothing said electric signal output from said sensor means at every picture element and for converting said electric signals into a digital signal, said digital signal having alternate high-level portions and low-level portions, said portions having time periods corresponding to said widths of said bars and spaces of said bar code;

width data producing means encased in said housing and responsive to said digital signal from said signal processing means, for producing a plurality of width data indicating said widths of said bars and spaces of said bar code on the basis of said high-level time periods and low-level time periods of said digital signal from said signal processing means;

memory means encased in said housing for successively storing said plurality of width data produced by said width data producing means;

classifying means encased in said housing for classifying said plurality of width data stored in said memory means into a plurality of groups;

correction means encased in said housing for correcting said plurality of width data so as to narrow scattering of said width data in each of said groups classified by said classifying means and for outputting corrected width data;

digital signal reproducing means encased in said housing for reproducing a digital signal having alternate high-level portions and low-level portions, said portions having time periods corresponding to said corrected width data output by said correction means; and

signal outputting means encased in said housing for outputting said digital signal reproduced by said reproducing means to decoder located external to said housing.

5,184,006

PHOTOELECTRIC CONVERSION APPARATUS HAVING CLOCK SIGNALS OF DIFFERENT FREQUENCIES

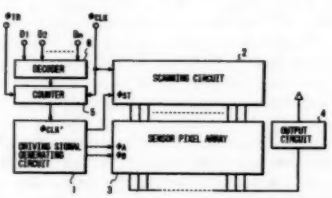
Isamu Ueno, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1991, Ser. No. 688,276

Claims priority, application Japan, Apr. 23, 1990, 2-105181; Apr. 23, 1990, 2-105182

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **10 Claims**



1. Photoelectric conversion apparatus comprising:

photoelectric conversion sensor unit having a plurality of photoelectric conversion sensors;

driving signal generating means for outputting a control signal for a photoelectric converting operation of said photoelectric conversion sensor unit; and

scanning means for outputting a control signal to output a photoelectrically converted signal from said photoelectric conversion sensor unit, wherein a first clock signal inputted into said driving signal generating means and a second clock signal inputted into said scanning means are independently provided.

5,184,007

METHOD OF DRIVING A THIN FILM TRANSISTOR TYPE OPTICAL SENSOR AND THE DRIVE UNIT

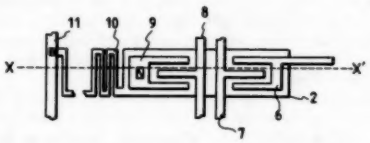
Toshihiro Saika, Zama; Isao Kobayashi, Sagamihara; Noriyuki Kaifu, Yokohama, and Tadao Endo, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1991, Ser. No. 675,336

Claims priority, application Japan, Mar. 27, 1990, 2-78405

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **27 Claims**



1. A method of driving a thin film transistor type optical sensor, comprising a gate electrode, a gate insulating layer, a thin film semiconductor layer, an ohmic contact layer, a source electrode and a drain electrode, said method comprising the step of driving the thin film transistor type optical sensor by providing the gate electrode with one of a threshold voltage for a thin film transistor provided adjacent to the thin film transistor type optical sensor and a voltage lower than said threshold voltage.

5,184,008

X-RAY IMAGING TUBE WITH SPECIFIC POSITIONAL AND SIZE RELATIONSHIP OF ELEMENTS

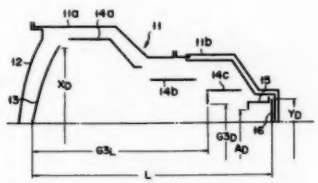
Keiichi Saito; Shigeharu Kawamura, both of Ootawara; Syozo Sato, Sagamihara, and Kiyohito Kawasumi, Kofu, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 10, 1991, Ser. No. 772,911

Claims priority, application Japan, Oct. 12, 1990, 2-272215

Int. Cl.[5] H01J *31/50*

U.S. Cl. 250—214 VT **3 Claims**



1. An X-ray imaging tube comprising:

a vacuum envelope, an input screen located in the input end of said envelope;

an output screen located in the output end of said vacuum envelope;

an anode located in the output end of said vacuum envelope; and

a plurality of beam-converging electrodes located in said vacuum envelope and arranged along the inner surface of said vacuum envelope,

wherein said components have specific positional relationship and particular sizes, thus satisfying the following relations:

$$3.5 \leqq G3_D/A_D \leqq 5.0$$

$$-3.65 \times MAG + 1.00 \leqq G3_L/L \leqq -3.65 \times MAG + 1.05$$

where L is the distance between said input and output screens, A_D is the inside diameter of said anode or that one of said beam-converging electrodes set at the same potential as said anode, which is located closer to said input screen than any other beam-converging electrodes set at the same potential as said anode, $G3_D$ is the inside diameter of that one of beam-converging electrodes set at potential of at least 2 KV, which is located closer to said input screen than any other electrode set at potential of at least 2 KV, $G3_L$ is the distance between said input screen and the electrode set at at least 2 KV and located closer to said input screen than any other electrode set at at least 2 KV, and MAG is the image-reducing ratio, i.e., (output-image diameter)/(maximum input effective diameter) of the X-ray imaging tube.

5,184,009

OPTICAL ATTENUATOR MOVEMENT DETECTION SYSTEM

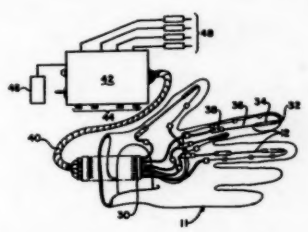
Scott M. Wright, and Raymond E. Wright, both of 69 Lakewood Dr., Mineral City, Ohio 44656

Continuation-in-part of Ser. No. 335,833, Apr. 10, 1989, Pat. No. 4,972,074. This application Apr. 6, 1990, Ser. No. 505,563

The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.11 **22 Claims**



1. An optical detection system comprising:

light emitting means positioned in a first conduit so as to emit light into said first conduit,

light detecting means positioned in said first conduit adapted to receive light emitted into said first conduit by said light emitting means,

wherein the relative longitudinal distance that said light emitted into said first conduit travels between said light emitting means and said light detecting means is varied within said conduit in proportion to a variable to be detected.

5,184,010

SPECTRUM MODULATION ENCODING SENSOR SYSTEM FOR REMOTELY DETECTING A PHYSICAL MAGNITUDE, AND OPERATING BY REFLECTION

Michel Lequime, Eguilles, France, assignor to Bertin & Cie, Plaisir, France

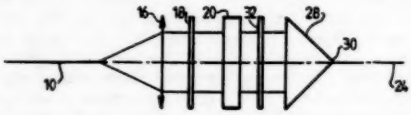
PCT No. PCT/FR91/00015, § 371 Date Sep. 5, 1991, § 102(e) Date Sep. 5, 1991, PCT Pub. No. WO91/10880, PCT Pub. Date Jul. 25, 1991

PCT Filed Jan. 11, 1991, Ser. No. 752,699

Claims priority, application France, Jan. 12, 1990, 90 00317

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.21 **11 Claims**



1. A system for remotely detecting a physical magnitude and operating by reflection, the system making use of the principle of encoding light by spectrum modulation, and comprising a source of incoherent light connected by an optical fiber to a sensor which has an optical axis and which comprises, successively on said optical axis, a collimator lens, a first polarizer, a birefringent sensitive component subjected to the physical magnitude to be measured, a second polarizer and a catadioptric reflection means, said catadioptric reflection means reflecting the light in a direction parallel to the direction of the incident light, the birefringent sensitive component having slow and fast axes, and the first and second polarizer having light-passing directions which are inclined relative to the said slow and fast axes of the birefringent sensitive component.

5,184,011

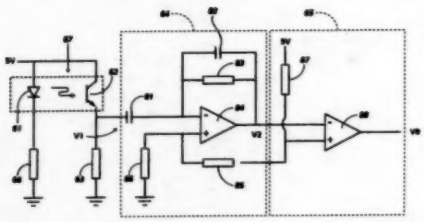
LINEAR ENCODER FOR DIGITAL PRINTING APPLICATIONS

Fred F. Hubble, III, Rochester; John M. Mitchell, Jr., Henrietta, and James P. Martin, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1991, Ser. No. 635,837

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.14 **10 Claims**



1. A printhead encoder including a scanning nip for achieving pixel to pixel registration when scanning a medium to be imprinted comprising:

means for providing a sensing beam;

means for causing interruptions in the sensing beam when scanning the medium to be imprinted;

means for detecting the interruptions and for producing a first voltage pattern based on the interruptions; and

means for outputting a second voltage pattern which is triggered at zero slope points of the first voltage pattern.

5,184,012

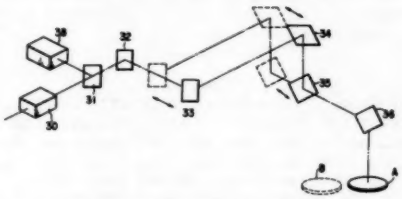
OPTICAL SCANNING APPARATUS WITH AXIS DEVIATION CORRECTION

Mitsunori Yamamoto, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1991, Ser. No. 813,813

Int. Cl.[5] H01J *3/14*

U.S. Cl. 250—234 **14 Claims**



1. An optical scanning apparatus comprising:

a light source;

a converging lens for converging a beam emitted by said light source and forming a beam spot on an object;

first deflecting means, movably arranged in an optical path and between said light source and said converging lens, for continuously changing an angle of the beam going out therefrom, thereby causing the beam spot formed on the object to move in a first direction;

second deflecting means, movably arranged in the optical path and between said first deflecting means and said converging lens, for continuously changing an angle of the beam going out therefrom thereby causing the beam spot formed on the object to move in a second direction; and

correcting means, arranged in the optical path and between said light source and said first deflecting means, for correcting deviation of an optical axis due to the movement of said first and second deflecting means,

wherein at least one of said first and second deflecting means is moved so that a conjugate plane with respect to a pupil of said converging lens is located at a desired portion between said first and second deflecting means.

5,184,013

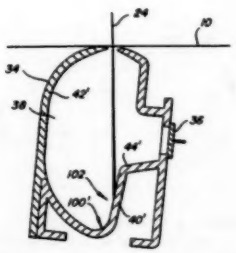
DIFFUSE LIGHT COLLECTOR WHICH MINIMIZES STREAK ARTIFACTS

John C. Boutet, and Thomas E. Kocher, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,800

Int. Cl.[5] H01J *3/14*; G01J *1/04*

U.S. Cl. 250—236 **3 Claims**



1. In a laser scanning apparatus, including means for scanning a laser beam across a substantially horizontally directed scanning region and means for translating an information medium through said scanning region, a diffuse light collector located below and adjacent to said scanning region for receiv-

ing light transmitted through said information medium, said collector comprising:

a horizontally disposed, hollow collector member extending the length of said scanning region, having diffusely reflecting interior surfaces forming a diffusely reflecting light cavity and having an elongated slot adjacent to said laser scanning region for receiving light from said information medium into said cavity, wherein said hollow member has a slanted light impingement opposite said slot and a lower region below said face, whereby dirt which falls into said cavity through said slot, cascades off of said face into said lower region; and

a photodetector communicating with said collector cavity for detecting light received into and diffusely reflected by said light cavity.

5,184,014

OPTO-ELECTRONIC SCALE READING APPARATUS

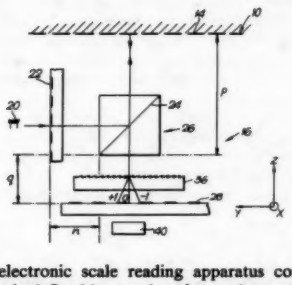
William F. N. Stephens, Badminton, and Stephen E. Lummes, Stroud, both of United Kingdom, assignors to Renishaw plc, Gloucestershire, United Kingdom

Filed Oct. 30, 1991, Ser. No. 785,090

Claims priority, application United Kingdom, Oct. 31, 1990, 9023659

Int. Cl.[5] H01J 3/14

U.S. Cl. 250—237 G **7 Claims**



1. Opto-electronic scale reading apparatus comprising a reflective scale defined by a series of spaced-apart lines, and a readhead movable relative to the scale in the direction of spacing of the lines, the readhead comprising: an index grating; an analyser, the index grating and analyser occupying spatially distinct positions; a light source for illuminating the scale via the index grating, thereby to generate a periodic light pattern in the plane of the analyser, and a modulation of light intensity upon relative movement of the scale and readhead; means for generating from said intensity modulation a plurality of phase-shifted electrical signals, each signal having a frequency corresponding to the frequency of said modulation;

wherein:

means are provided for directing the light

a) along a first path from the index grating to an intersection point;

b) from the intersection point, to the scale and back to the intersection point along a common path in a direction substantially perpendicular to the scale; and

c) from the intersection point to the analyser, along a second path.

5,184,015

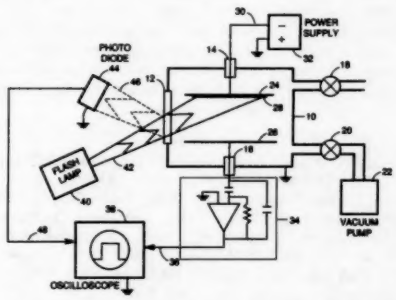
CHARGED PARTICLE MOBILITY REFRIGERANT ANALYZER

Steve L. Allman; Chung-Hsuan Chen, and Fang C. Chen, all of Knoxville, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Sep. 27, 1991, Ser. No. 766,542

Int. Cl.[5] B01D 59/44; H01J 49/00

U.S. Cl. 250—282 **5 Claims**



1. A method for determining the makeup of a mixture of known refrigerants comprising the steps of:

providing an analysis chamber;

providing an electric field of known potential within said analysis chamber;

admitting into said analysis chamber a gaseous sample containing a mixture of known refrigerants;

providing a pulse of free electrons within said electric field so that said pulse of free electrons interacts with said mixture so that a swarm of electrically charged particles is produced within said electric field;

measuring the mobility of said electrically charged particles within said electric field; and,

comparing said measurement to data obtained from mixtures of said refrigerants having known makeup.

5,184,016

GLOW DISCHARGE SPECTROMETRY

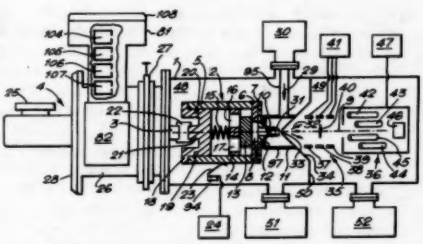
Gerard A. Ronan, Manchester, and Alistair Cole, Chester, both of England, assignors to VG Instruments Group Limited, Uxbridge, England

Filed Jan. 10, 1991, Ser. No. 639,802

Claims priority, application United Kingdom, Jan. 10, 1990, 9000547

Int. Cl.[5] H01J 37/08, 49/26

U.S. Cl. 250—288 **23 Claims**



1. A spectrometer for the analysis of a solid sample, said spectrometer comprising a discharge chamber into which a discharge gas may be introduced, means for maintaining a glow discharge in said discharge chamber adjacent to a said solid sample, and means for analyzing emission from said glow

discharge which is characteristic of said solid sample, wherein there is also provided a unitary source assembly engagable with said discharge chamber and wherein:

a) said unitary source assembly comprises first electrode means against which a said solid sample may be mounted and second electrode means which provide the engagement between said unitary source assembly and said discharge chamber;

b) said unitary source assembly is removable from engagement with said discharge chamber to facilitate introduction of a said solid sample; and

c) said means for maintaining a glow discharge comprises means for maintaining a potential difference between said first and said second electrode means when said unitary source assembly is engaged with said discharge chamber.

5,184,017

METHOD AND APPARATUS FOR DETECTING A COMPONENT GAS IN A SAMPLE

Edward L. Tury, Brighton, Mich.; Keith Kaste; Ross E. Johnson, both of San Luis Obispo, Calif., and David O. Danielson, Gregory, Mich., assignors to Sensors, Inc., Saline, Mich.

Division of Ser. No. 406,041, Sep. 12, 1989, Pat. No. 5,060,505. This application Aug. 19, 1991, Ser. No. 746,939

Int. Cl.[5] G01N *21/61*

U.S. Cl. 250—343 **16 Claims**

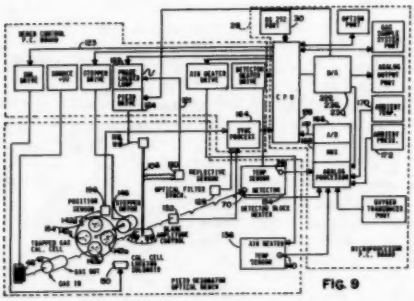


FIG. 9

1. An apparatus for detecting a component as in a sample comprising:

a sample chamber for containing a sample gas including the component gas to be detected;

source means for directing infrared radiation through the sample chamber in a preselected spectral band;

detector means responsive to radiation incident thereon in the preselected spectral band passing through the sample chamber from the source means for producing a detector output;

signal processing means responsive to said detector output for indicating the relative concentration of the component gas to be detected, said signal processing means including a circuit having first and second inputs and adapted to producing a difference output that is the difference between a signal provided to said first input and a signal provided to said second input;

first means for concurrently applying said detector output to said first input and a zero-value signal to said second input with substantially nonabsorbent gas filling the sample chamber to produce an offset value on said difference output;

second means for concurrently applying both said detector output to said first input and said offset value to said second input with a sample gas including a component gas to be detected filling said sample chamber thereby producing a difference output that indicates the relative concentration of said component gas.

5,184,018

SENSOR MATRIX

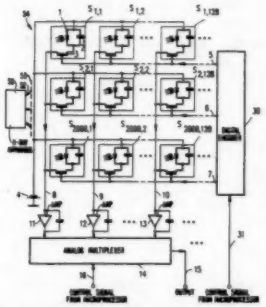
Norbert Conrads, Hauset, Belgium; Ulrich Schiebel, and Herfried Wieczorek, both of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1991, Ser. No. 644,713

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002431

Int. Cl.[5] H04N *5/32*; G01T *1/24*

U.S. Cl. 250—370.09 **15 Claims**



1. A radiation sensor device comprising:

an array of radiation sensors arranged in rows and columns in a matrix, said sensors each generating a charge the magnitude of which is in dependence upon the amount of incident radiation on that sensor;

a plurality of electric switches, each associated with a different sensor, said sensors and switches each comprising thin film elements;

a plurality of switch control lines, each line corresponding to a different row for receiving an applied switch activate signal for activating the switches of that row to simultaneously output the charges of the sensors corresponding to the relevant activated switches of a sensor row;

a plurality of parallel read lines for receiving the outputted charges;

transfer means for converting the outputted charges on said read lines into a serial signal; and

an amplifier comprising a crystalline semiconductor coupled to each read line preceding said transfer means for amplifying the outputted charges on the corresponding read line.

5,184,019

LONG RANGE ALPHA PARTICLE DETECTOR

Duncan W. MacArthur; Michael A. Wolf; James L. McAtee; Wesley P. Unruh; Alfred L. Cucchiara, and Roger L. Huchton, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 494,286, Mar. 16, 1990, abandoned. This application Jun. 3, 1991, Ser. No. 709,566

Int. Cl.[5] H01J *47/02*

U.S. Cl. 250—380 **18 Claims**

1. An alpha particle detector that operates by detecting air ions created by collisions with alpha particles comprising:

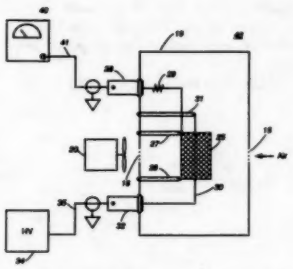
an electrically conductive enclosure defining first and second openings for admitting and exhausting air;

two or more electrical conductors insulatively mounted inside said enclosure;

means for generating a voltage in one of said electrical conductors, creating an electric field between said two or more electrical conductors;

fan means mounted outside said enclosure adjacent to said second opening for drawing air containing said air ions

through said first opening in said enclosure and across said electric field between said two or more electrical conductors; and



detecting means connected to another one of said two or more electrical conductors for indicating a current through said another one of said two or more electrical conductors produced by said air ions.

5,184,020

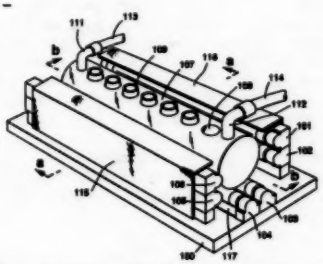
DEVICE AND METHOD FOR PHOTOACTIVATION

David P. Hearst, 1747 29th Ave., San Francisco, Calif. 94122; George D. Cimino, 1435 Liberty St., El Cerrito, Calif. 94530; John E. Hearst, 101 Southampton Ave., Berkeley, Calif. 94707, and Stephen T. Isaacs, 79 Loma Vista Dr., Orinda, Calif. 94563

Filed Oct. 26, 1989, Ser. No. 428,510

Int. Cl.[5] G01N *21/85*

U.S. Cl. 250—455.11 **33 Claims**



1. A photoactivation device for treating photoreactive compounds, comprising:

a) means for continuously flowing sample liquid containing photoreactive compound;

b) means for providing appropriate wavelengths of electromagnetic radiation in a fixed relationship with said continuous flowing means for cause activation of at least one photoreactive compound; and

c) means for maintaining the temperature of said continuously flowing sample liquid within a desired temperature range during said activation.

5,184,021

METHOD AND APPARATUS FOR MEASURING THE DIMENSIONS OF PATTERNED FEATURES ON A LITHOGRAPHIC PHOTOMASK

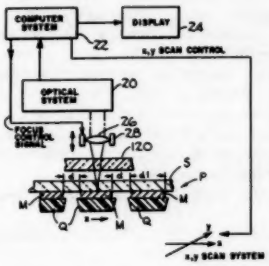
Ian R. Smith, Los Gatos, Calif., assignor to SiScan Systems, Inc., Campbell, Calif.

Filed Jun. 24, 1991, Ser. No. 719,519

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—560 **18 Claims**

1. A method for measuring the dimensions of the patterned features on a lithographic photomask comprising the steps of placing the photomask in a position to be viewed by an optical microscope using reflected light so that the unpatterned substrate side of the photomask is in a position facing the microscope, and obtaining reflectivity information at various points on the patterned layer of the photomask so as to provide information indicative of the dimensions of the features in the patterned layer of the photomask.



5,184,022

CENTRAL LOCKING SYSTEM AND SECURING DEVICE AND METHOD FOR CONTROLLING SAME

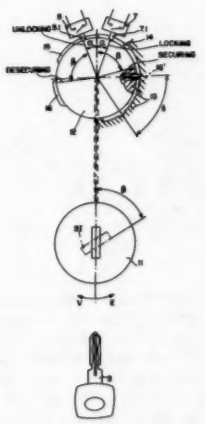
Klaus Claar, Gechingen; Hans Deischl, Jettingen; Martin Lindmayer, Böblingen; Jürgen Moczygemba, Lichtenstein; Jörgen Schrader, Stuttgart; Josef Schumacher, Reutlingen; Claus Töpfer, and Peter Robitschko, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 21, 1991, Ser. No. 658,678

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1990, 4006122

Int. Cl.[5] E05B *65/20*

U.S. Cl. 307—10.2 **16 Claims**



1. Method for electrically controlling a central locking system and a securing device for motor vehicles which have at least one lock cylinder with at least two associated control switches, wherein for the electrical control of the unlocking or locking of the central locking system and the disabling or enabling of the securing device, the lock cylinder is pivotable by means of a key out of a neutral position in an unlocking direction or oppositely in a locking direction and at least beyond a regular locking position by further pivoting in the locking direction into a securing position for enabling the

securing device, said securing device providing for additional mechanical blocking of locked closures by being enabled and disabled by means of signals generated by the two control switches, the method comprising:

controlling the central locking system respectively in the unlocking direction by actuating an unlocking one of the associated control switches and in the locking direction by actuating a locking one of the associated control switches;

successively actuating the two control switches during the pivoting of the lock cylinder into the securing position wherein the two control switches are in a joint switching state immediately following the successive actuation of the two control switches during the pivoting of the lock cylinder into the securing position;

evaluating the joint switching state for enabling the securing device;

disabling the securing device by actuating the unlocking one of the associated switches.

5,184,023

SELF-CONTAINED ANTI-THEFT DEVICE FOR MOTOR VEHICLES

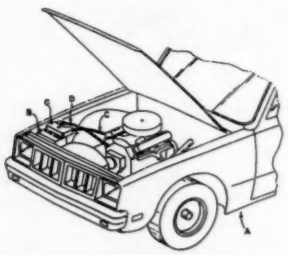
Louis D. Carlo, Cleveland, and Joey B. Adkins, Northfield, both of Ohio, assignors to James E. Winner, Sharon, Pa.

Continuation of Ser. No. 572,684, Aug. 27, 1990, Pat. No. 5,132,551, which is a division of Ser. No. 564,702, Dec. 23, 1983, Pat. No. 4,958,084. This application Dec. 26, 1991, Ser. No. 813,596

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.[5] B60R *25/04*

U.S. Cl. 307—10.3 **2 Claims**



1. An anti-theft device connected or attached to a standard battery of a motor vehicle having normal electrical components and a starting circuit including a starter, said battery providing a low level of current to operate said normal electrical components when said vehicle is operated and a high level of current to operate said starter, said anti-theft device comprising a switching means having a first position electrically connecting one of said battery's electrodes with said starting circuit, and a second position electrically disconnecting one of said battery's electrodes from said starting circuit, detector means for detecting flow of current across said battery's electrodes when greater than a preselected value which is greater than said low level, and means for shifting said switching means to said second position only upon detection of said preselected value of current flow and timing means for deactivating said shifting means for a known time upon receipt of a specific external command signal.

5,184,024

APPARATUS TO REGULATE THE ILLUMINATION RANGE OF A MOTOR VEHICLE

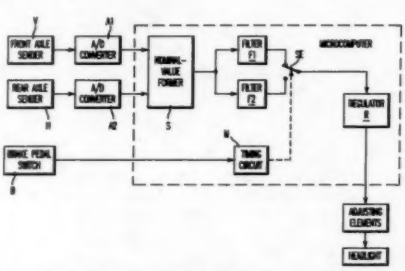
Micha Hussmann, Lippstadt, and Joachim Hufnagel, Menden, both of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany

Filed Jul. 30, 1991, Ser. No. 737,724

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1990, 4024912

Int. Cl.[5] B60L *1/14;* **B60Q** *1/115*

U.S. Cl. 307—10.8 **2 Claims**



1. Apparatus to regulate the illumination range of a motor vehicle having a front axle sender at a front wheel axle and a rear axle sender at a rear wheel axle whose output signals are a function of the relative position of a motor vehicle body to the wheel axles, having a nominal-value former which forms nominal-value signals indicative of a difference between the signals from the front axle sender and the rear axle sender, having a first filter including an average-value former which, in dependence upon a first filter time constant of the first filter, forms filtered nominal-value signals from the nominal-value signals of the nominal-value former, and having a regulator which regulates adjusting elements for adjustment of positions of headlights, wherein the improvement that the apparatus further includes a second filter, the nominal-value former is coupled with the first filter and the second filter, the second filter has a second filter time constant which is shorter than the first filter time constant of the first filter, the regulator is coupled to the first filter or the second filter by a switch-over device, the switch-over device is controllable by a signal from a brake-pedal switch, and the brake pedal switch is coupled with a timing circuit whose output signals control the switch-over device.

5,184,025

COMPUTER-CONTROLLED UNINTERRUPTIBLE POWER SUPPLY

Patrick W. McCurry, Keizer; James R. Kellogg, Medford; Karl Boekelheide, Tigard; Kenneth D. Sexton; George A. Ellison, both of Salem, and Robert A. Hocker, Molalla, all of Oreg., assignors to Elegant Design Solutions, Inc., Salem, Oreg.

Continuation of Ser. No. 638,454, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 270,715, Nov. 14, 1988, Pat. No. 5,019,717. This application Oct. 1, 1991, Ser. No. 771,781

Int. Cl.[5] H02J *7/00;* **H02M** *3/335*

U.S. Cl. 307—66 **4 Claims**

1. A power supply system comprising:

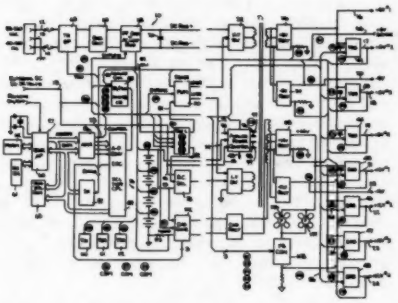
DC input means for providing a DC power signal to the system:

means for rectifying an ac power signal, when one is supplied to said system, and providing a rectified signal;

first regulating means for regulating said rectified signal and providing a first regulated DC signal, said first regulating means including a first switch mode regulator;

second regulating means for regulating a DC signal and providing a second regulated DC signal, said second regulating means including a second switch mode regulator having a switching frequency;

control means for causing either said DC power signal or said first regulated signal, when both said DC power signal and said AC power signal are supplied and one of them when only one of them is supplied, to be coupled to



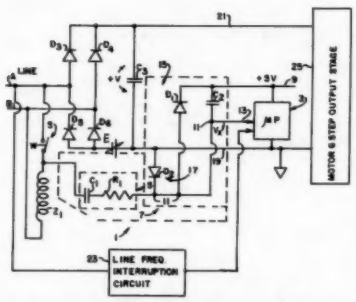
the second regulating means; said control means being settable to cause a preselected one of said DC power signal and said first regulated signal to be coupled to said second regulating means when both said DC power signal and said AC power signal are supplied.

5,184,026

ISOLATION CIRCUIT FOR DETECTING THE STATE OF A LINE CONNECTED SWITCH

Ciaran S. O Breartuin, Clayton, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 19, 1990, Ser. No. 630,014
Int. Cl.[5] H02J *13/00*
U.S. Cl. 307—139 **7 Claims**



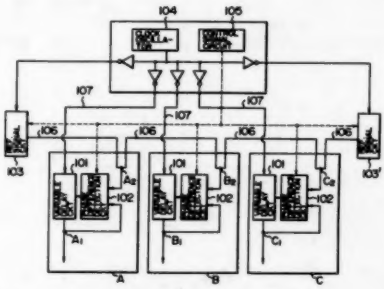
1. Un an apparatus having a switch operatively connected to a power line, the status of the switch being used to determine operational requirements for the apparatus, the apparatus including a microprocessor for determining an operational sequence for said apparatus in response to the status of said switch, the improvement comprising means for monitoring the status of the switch, said monitoring means including means for sensing positive and negative transitions on the power line, said sensing means having an input side electrically operatively connected to the switch and an output side, means for converting the sensed transitions into a rectangular wave form, said converting means having an input side connected to the output side of said sensing means and an output side connected to the microprocessor, said sensing means detecting the status of the switch by sensing a phase shift at the switch as an indication of the switch status.

5,184,027

CLOCK SIGNAL SUPPLY SYSTEM

Noboru Masuda, Kokubunji; Ryotaro Kamikawai, Tokyo; Masayoshi Yagyu, Kokubunji; Masakazu Yamamoto; Hiroyuki Itoh, both of Kodaira, and Tatsuya Saito, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 152,916, Feb. 5, 1988, abandoned. This application Apr. 22, 1991, Ser. No. 688,696
Claims priority, application Japan, Mar. 20, 1987, 62-63782; Jun. 8, 1987, 62-141459; Jun. 8, 1987, 62-141460
Int. Cl.[5] H03K *5/00, 5/13*
U.S. Cl. 307—269 **21 Claims**



1. A clock signal supply system comprising:

a clock signal oscillator producing a clock signal;

a plurality of first means for receiving said clock signal applied thereto, said clock signal having an associated phase, and each of said first means further including means for adjusting the phase of the clock signal and producing an output of phase-adjusted clock signals from the received clock signal;

a plurality of first signal lines for transmitting the clock signals produced from the clock signal oscillator to each of the first means;

second means for generating a reference signal in predetermined relationship wit the clock signals produced from the clock signal oscillator, said second means including a first reference signal circuit and a second reference signal circuit;

a pair of second signal lines connecting said first and second reference signal circuits to each of said first means and to each other, and transmitting the reference signal from the second means to each of the first means, said second means generating the reference signal in either of a first or second direction along one of said pair of second signal lines between said first and second reference signal circuits;

wherein each of said first means includes means for comparing said phase-adjusted clock signal produced form the clock signal received through an associated first signal line, with the reference signal transmitted by said one of the second signal lines, and means for adjusting the phase of the clock signal received through the first signal lie into a predetermined phase relationship with the reference signal based on the results of the comparison by said means or comparing;

further wherein a first signal produced by said first reference signal circuit is transmitted along a first one of said pair of second signal lines in a first direction, and a second signal produced by said second reference signal circuit is transmitted in a second direction, opposite to the first direction, along the other of said pair of second signal lines; and

wherein said means for comparing compares said phase-adjusted clock signal that is produced from the clock signal received through the first signal line with said first signal received through said first one of said pair of second signal lines, and compares said phase-adjusted clock signal

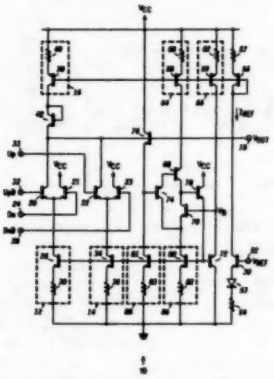
produced from the clock signal received through the first signal line with said second signal received through the second one of said pair of second signal lines, thereby to adjust the phase of the clock signal in such a manner to attain a predetermined phase relationship between the clock signal received through said first signal line and said first and second signals received through said pair of second signal lines respectively.

5,184,028

CURRENT COMPENSATING CHARGE PUMP CIRCUIT

Don W. Zobel, Miami, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 15, 1992, Ser. No. 898,998
Int. Cl.[5] H03K *3/01, 5/22*
U.S. Cl. 307—270 **7 Claims**



1. A charge pump circuit (**10**) for providing an output voltage (V_{OUT}) at an output terminal (**18**), comprising:

a reference circuit responsive to a reference voltage (V_{REF}) for providing a reference current;

a first pull up current source (**16**) having first and second terminals and a control terminal, said first terminal of said first pull up current source being coupled to a first supply voltage terminal (V_{CC}), said control terminal of said first pull up current source being coupled to said reference circuit;

a second pull up current source (**64**) having first and second terminals and a control terminal, said first terminal of said second pull up current source being coupled to said first supply voltage terminal, said control terminal of said second pull up current source being coupled to said reference circuit;

a first pull down current source (**12**) having first and second terminals and a control terminal, said second terminal of said first pull down current source being coupled to a second supply voltage terminal (GRD), said control terminal of said first pull down current source being coupled to a bias line for applying a voltage thereto;

a second pull down current source (**14**) having first and second terminals and a control terminal, said second terminal of said second pull down current source being coupled to said second supply voltage terminal, said control terminal of said second pull down current source being coupled to said control terminal of said first pull down current source;

a third pull down current source (**86**) having first and second terminals and a control terminal, said second terminal of said third pull down current source being coupled to said second supply voltage terminal, said control terminal of said third pull down current source being coupled to said control terminal of said second pull down current source;

a first switch (**20, 21**) coupled between said first terminal of said first pull down current source and the output terminal, said first switch being responsive to a first differential input signal for alternately enabling and disabling said first pull down current source;

a second switch (**22, 23**) coupled between said first terminal of said second pull down current source and the output terminal, said second switch being responsive to a second differential input signal for alternately enabling and disabling said second pull down current source; and

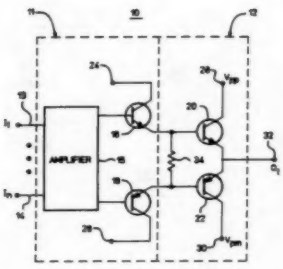
circuit means coupled to said second terminal of said first pull up current source, to the output terminal, to said second terminal of said second pull up current source, and to said first terminal of said third pull down current source for maintaining a voltage across said second pull up current source to be substantially equal to a voltage across said first pull up current source thereby allowing a current through said second pull up current source to remain substantially equal to a current through said first pull up current source due to a voltage change occurring at the output terminal.

5,184,029

DRIVER CIRCUIT FOR CIRCUIT TESTER

Philip N. King, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 15, 1991, Ser. No. 776,108
Int. Cl.[5] H03K *3/01, 19/086*
U.S. Cl. 307—270 **15 Claims**



1. A driver circuit for providing high-speed test signals to an electronic device under test, the driver circuit comprising:

a pre-driver stage with inputs and outputs, said inputs connected to control signals, said outputs comprising actuation signals, said pre-driver stage comprising an amplifier connected to first and second switching transistors, said switching transistors capable of fast switching on and off, in and out of saturation, respectively; and

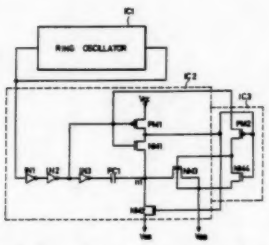
a driver stage which receives said actuation signals produced from said pre-driver stage and drives said test signals, said driver stage comprising first and second emitter follower transistors, said first emitter follower transistor coupled to said first switching transistor, said second emitter follower transistor coupled to said second switching transistor, said emitter follower transistors configured to switch on and off in a condition outside of saturation when driving said test signals.

5,184,030

BACK BIAS GENERATING CIRCUIT

Jin Y. Chung, and Deog Y. Kwak, both of Seoul, Rep. of Korea, assignors to Goldstar Electron Co., Ltd., Choongchungbook, Rep. of Korea

Filed Dec. 26, 1991, Ser. No. 813,611
Claims priority, application Rep. of Korea, Apr. 12, 1991, 5890/1991
Int. Cl.[5] H03K *3/01*
U.S. Cl. 307—296.01 3 Claims



1. A back bias generating circuit, comprising:

ring oscillating means for generating a signal of alternating current waveform;

back bias generating means coupled to said ring oscillating means for generating a back bias voltage;

said back bias generating means including first through third inverter gates for respectively inverting the signal from said ring oscillating means, a pumping capacitor for receiving at one terminal an output voltage from said third inverter gate, and a switching transistor having a gate and first and second conduction terminals for applying an output voltage at the other terminal of said pumping capacitor to a back bias terminal, said other terminal of said pumping capacitor being controlled, in accordance with a level of said signal from said ring oscillating means, such that said other terminal is connected to a ground terminal; and

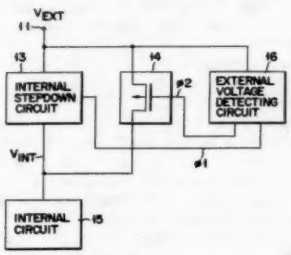
switching transistor control means for controlling a voltage to be applied between the gate and one of said conduction terminals of said switching transistor for switching said switching transistor in accordance with a level of said signal from said ring oscillating means.

5,184,031

SEMICONDUCTOR INTEGRATED CIRCUIT

Shigeyuki Hayakawa, Yokohama, and Leiichi Yanagisawa, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 7, 1991, Ser. No. 651,440
Claims priority, application Japan, Feb. 8, 1990, 2-27086
Int. Cl.[5] H03K *3/01*
U.S. Cl. 307—296.3 23 Claims



1. A semiconductor integrated circuit comprising:

an internal circuit having a node;

first means for receiving a supply voltage;

second means for receiving a second voltage;

voltage detecting means for detecting a value of the supply voltage;

voltage stepdown means for operating in one of

a first mode for stepping down the supply voltage to apply a voltage to the node while conducting a first amount of current through the second receiving means, and

a second mode while conducting an amount of current less than the first amount of current through the second receiving means, the voltage step down means operating in either the first mode or in the second mode in response to the voltage detecting means; and

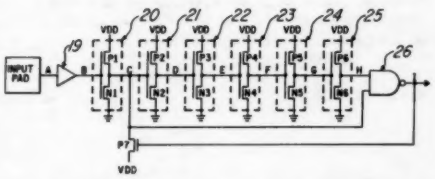
means, coupled between the first receiving means and the node and responsive to the voltage detecting means, for selectively applying a voltage to the node at times when the voltage stepdown means is operating in the second mode.

5,184,032

GLITCH REDUCTION IN INTEGRATED CIRCUITS, SYSTEMS AND METHODS

Jerald G. Leach, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 25, 1991, Ser. No. 691,266
Int. Cl.[5] H03K *17/19*
U.S. Cl. 307—443 16 Claims



1. An integrated circuit having a clock input pad and comprising:

a. circuitry operative in response to a clock signal having transitions, said clock transitions at said clock input pad being potentially subject to glitches; and

b. a glitch remover circuit having a logic gate having first and second inputs, said glitch remover circuit having a series of circuits coupled between said clock input pad and said first input, each one of said series of circuits having differing delays for positive signal edges than for negative signal edges, said second input coupled to the input of one of said series of circuits.

5,184,033

REGULATED BICMOS OUTPUT BUFFER

Jennifer Y. Chiao; Stephen Flannagan, and Taisheng Feng, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 20, 1991, Ser. No. 763,018
Int. Cl.[5] H03K *19/003, 19/0175;* H03F *3/45*
U.S. Cl. 307—446 15 Claims

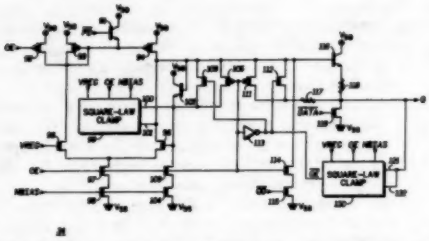
1. A regulated BICMOS output buffer comprising:

a difference amplifier for providing a first voltage signal in response to a difference between first and second input voltages, said first input voltage being a reference voltage;

a first transistor having a collector coupled to a first power supply voltage terminal, a base for receiving said first voltage signal, and an emitter coupled to a bonding pad;

a second transistor having a first current electrode coupled to said bonding pad, a control electrode for receiving a data signal, and a second current electrode coupled to a second power supply voltage terminal; and

a third transistor having a collector coupled to said first power supply voltage terminal, a base for receiving said



first voltage signal, and an emitter for providing said second input voltage of said difference amplifier.

5,184,034

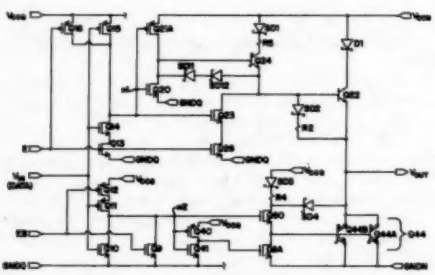
STATE-DEPENDENT DISCHARGE PATH CIRCUIT

James R. Ohannes, Portland; Stephen W. Clukey, South Portland; Ernest D. Haacke, Westbrook, and Roy L. Yarbrough, Hiram, all of Me., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 6, 1991, Ser. No. 804,906

Int. Cl.[5] H03K *19/013, 19/0952*

U.S. Cl. 307—473 **10 Claims**



1. A state-dependent-discharge-path circuit for discharging a control node of an output pullup transistor of a tristate output buffer, where said tristate output buffer comprises a data signal input and an enable signal input, wherein said data signal input is coupled to a pullup-predriver-inverter-stage, wherein said state-dependent discharge path comprises a first ground link and a second ground link wherein first ground link is coupled between said control node and a low potential power rail and comprises

(a) a first discharge transistor controlled by output of said pullup-predriver-inverter-stage and coupled in series with

(b) a breakdown-protection-voltage-drop device, and wherein said second ground link is coupled between said base node and ground and comprises

(a) a second discharge transistor controlled by output of said pullup predriver inverter stage and coupled in series with

(b) a discharge enable transistor which is controlled directly by said enable signal input.

5,184,035

BOOTSTRAP CIRCUIT INCORPORATED IN SEMICONDUCTOR MEMORY DEVICE FOR DRIVING WORD LINES

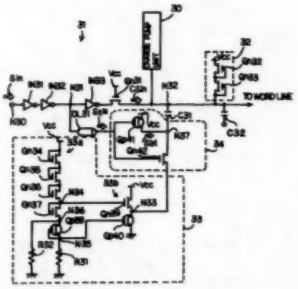
Tadahiko Sugibayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 8, 1991, Ser. No. 696,961

Claims priority, application Japan, May 11, 1990, 2-121752

Int. Cl.[5] H03K *19/01*

U.S. Cl. 307—482 **19 Claims**



1. A bootstrap circuit comprising

a) an input node which receives an input signal, the input node remaining in a low voltage level in the absence of the input signal;

b) an output node;

c) a bootstrap unit supplied from the input node with the input signal and including a bootstrap capacitor having first and second electrodes and a load capacitor coupled to the output node wherein the first electrode of the bootstrap capacitor is coupled to the output node and the bootstrap unit is responsive to a booting signal supplied to the second electrode of the bootstrap capacitor for bootstrapping an output voltage at the output node over a power voltage to a first predetermined level

d) a constant voltage source operative to produce a second predetermined voltage level higher than the low voltage level and lower then the booting signal; and

e) a switching unit coupled to the constant voltage source and to the bootstrap unit, said switching unit being operative to supply the booting signal to the second electrode of the bootstrap capacitor in the presence of the input signal and to feed the second predetermined voltage level to the second electrode of the bootstrap capacitor in the absence of the input signal.

5,184,036

METHOD OF LIMITING OUTPUT CURRENT FROM AN INTERFACE DRIVE CIRCUIT

Scott B. Kesler, and Mark W. Gose, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 9, 1991, Ser. No. 742,813

Int. Cl.[5] H03K *5/08;* **H03L** *5/00;* **H02H** *3/08*

U.S. Cl. 307—540 **4 Claims**

1. A circuit comprising:

a source of electric power;

an external resistor; and

an integrated circuit comprising

(a) a first voltage supply line having a first voltage level, VS1, coupled to the source of electric power,

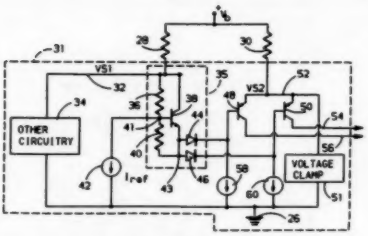
(b) a second voltage supply line having a second voltage level, VS2, coupled to the source of electric power by the external resistor, the second voltage level, VS2, varying in response to a resistor current flowing through the external resistor,

(c) an integrated circuit common ground,

(d) a drive transistor connected to the second voltage supply line and receiving power therefrom, the drive transistor having an output current controlled by a base drive current supplied to a base of the drive transistor,

(e) a control circuit coupled between the first voltage supply line and the integrated circuit ground, and

(f) means within the control circuit for limiting the base drive current in response to a variation in the resistor current and resulting variation in the second voltage level



VS2, said means limiting the base drive current by reducing the base drive current when VS1 - VS2 is equal to a predetermined value, V_{lim}, wherein

the control circuit comprises a control transistor having a collector connected to the first voltage supply line, an emitter coupled to the base of the drive transistor and a control transistor base coupled to a current source, the control transistor operable to reduce the base drive current when VS1 - VS2 equals V_{lim}.

5,184,037

MAGNETOSTRICTION TYPE ACTUATOR

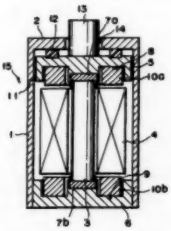
Tadahiko Kobayashi, and Masashi Sahashi, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 22, 1991, Ser. No. 659,172

Claims priority, application Japan, Feb. 23, 1990, 2-40928; Feb. 23, 1990, 2-40929; Feb. 23, 1990, 2-40930; Mar. 30, 1990, 2-83220

Int. Cl.[5] H01L *41/12*

U.S. Cl. 310—26 **15 Claims**



1. A magnetostriction type actuator comprising:

displacement generating means formed of a magnetic substance having magnetostriction;

a movable member fixed to said displacement generating means, which movable member is movable in the direction of displacement of said displacement generating means;

magnetic field generating means, provided around said displacement generating means, for applying a magnetic field to said displacement generating means;

a magnetic circuit component for constituting, along with said movable member, a main part of a closed magnetic circuit, within which magnetic circuit component said displacement generating means and said magnetic field generating means are stored; and

an elastic member, disposed within said magnetic circuit component, for applying a compression force to said displacement generating means via said movable member in the direction of displacement of said displacement generating means.

5,184,038

METHOD OF COUPLING MAGNETIC POSITION DETECTING DEVICE WITH BRUSHLESS DC MOTOR AND THE COUPLING STRUCTURE THEREOF

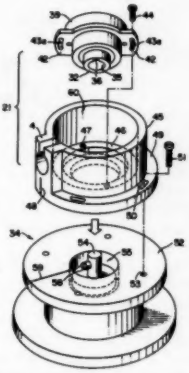
Masahiro Matsui, Akashi, and Yasuhiko Hashimoto, Kobe, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 644,977, Jan. 23, 1991, abandoned. This application Feb. 20, 1992, Ser. No. 839,264

Claims priority, application Japan, Jan. 23, 1990, 2-14174; Nov. 29, 1990, 2-334871

Int. Cl.[5] H02K *15/00*

U.S. Cl. 310—42 **2 Claims**



1. A method of coupling a magnetic pole position detecting device to a brushless dc motor, the dc motor having an output shaft and a motor case, and the magnetic pole position detecting device including a rotor part having an input shaft with a slit indicative of a rotor zero point, a stator part having detecting circuit means for outputting the absolute value of a relative angle between the rotor part and the stator part, and a device case with a scribed locating mark on the surface thereof, said method comprising the steps of:

(a) determining relative angular positional relationships between the rotor part, the stator part and the device case of the magnetic pole position detecting device by

i) providing a jig that has a shaft with a pin and a plate having ascribed mark on its surface, and mounting the detecting device to the jig by inserting the pin of the jig in the slit of the detecting device and aligning the scribed mark on the surface of the device case with the scribed mark on the plate of the jig,

ii) then adjusting the relative angular positional relationship between the stator part and the rotor part by rotating the stator part until the detecting circuit means outputs a predetermined value, and

iii) fixing the stator part relative to the device case;

(b) coupling the output shaft of the motor to the rotor part of the magnetic pole position detecting device;

(c) rotating the shaft of the motor externally; and

(d) scribing another locating mark on the motor case in alignment with the mark scribed on the device case, under a condition in which the relative angular positional relationship between the motor case and the device case is

such that a back E.M.F. waveform of the motor and a waveform of the absolute value output by the detecting circuit means of the detecting device are in phase.

5,184,039

MOTOR/GEAR-TRAIN DRIVE UNIT, PARTICULARLY MOTOR-VEHICLE POWER-WINDOW DRIVE

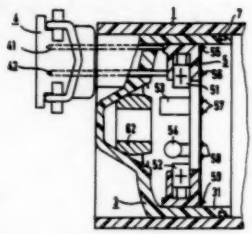
Longin Kraft, Gerbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 8, 1991, Ser. No. 742,847

Claims priority, application European Pat. Off., Aug. 23, 1990, 90116184.4

Int. Cl.[5] H02K *5/00*

U.S. Cl. 310—89 **16 Claims**



1. A motor/gear-train drive unit, comprising:
a motor frame having an inner surface;
a commutator motor enclosed in said motor frame;
a gear case disposed adjacent to said motor frame; and
a preassembled subassembly including:
a bearing cap;
a brush support plate mounted in said bearing cap; and
plug pins bonded to said brush support plate and extending outwardly, in a sealed manner, through said bearing cap;
said subassembly having an outer surface which conforms to said inner surface of said motor frame so as to be continuously displaceable, by insertion, relative to said motor frame and able to be secured to the motor frame in a final operating position; and
a peripheral seal ring tightly sealing said subassembly from said motor frame.

5,184,040

ELECTRIC POWER GENERATORS HAVING LIKE NUMBERS OF MAGNETS AND COILS

Jong H. Lim, Kumhwa Apt 14-209, Seodaemunku Cheonyeon-dong, D.P.R. of Korea

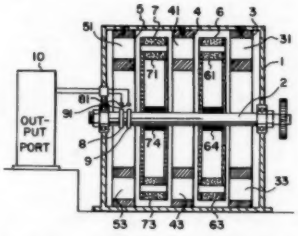
Filed Aug. 30, 1990, Ser. No. 575,536

Claims priority, application Rep. of Korea, Sep. 4, 1989, 1989-12812; Sep. 4, 1989, 1989-12813; Sep. 4, 1989, 1989-12814

Int. Cl.[5] H02K *16/00*

U.S. Cl. 310—114 **5 Claims**

1. An electric power generator having a body case comprising:
a driving shaft;
a first permanent magnet disk fixed to the body case of the electric power generator and including several permanent magnets and a supplementary permanent magnet associated with each permanent magnet, the magnets being inserted and fixed at a predetermined interval of a given angle for the driving shaft, wherein each supplementary permanent magnet is separated from its associated permanent magnet by a predetermined air gap;
a second permanent magnet disk fixed to the body case and including several permanent magnets and a supplementary permanent magnet associated with each permanent magnet, the magnets being inserted and fixed at the predetermined interval of a given angle for the driving shaft, wherein each supplementary permanent magnet is separated from its associated permanent magnet by a predetermined air gap;
a third permanent magnet disk fixed to the body case and including several permanent magnets and a supplementary permanent magnet associated with each permanent magnet, the magnets being inserted and fixed at the predetermined interval of a given angle for the driving shaft, wherein each supplementary permanent magnet is separated from its associated permanent magnet by a predetermined air gap;



a first coil disk fixed to the driving shaft and located between the first and second permanent magnet disks and including several coils corresponding to the permanent magnets which are inserted and fixed at the predetermined interval of a given angle for the driving shaft;
a second coil disk fixed to the driving shaft and located between the second and third permanent magnet disks and including several coils corresponding to the permanent magnets which are inserted and fixed at the predetermined interval of a given angle for the driving shaft; and
line connection means for connecting output lines of the coils in parallel.

5,184,041

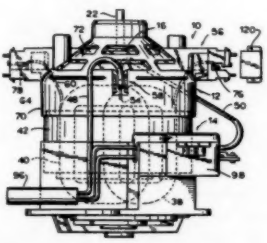
STRUCTURE FOR COUPLING FIELD WINDINGS TO MOTOR BRUSHES

Mark Baer, Linden, and R. Lent Crevling, Jr., Williamsport, both of Pa., assignors to Shop Vac Corporation, Williamsport, Pa.

Filed Mar. 12, 1991, Ser. No. 667,977

Int. Cl.[5] H02K *13/00*

U.S. Cl. 310—239 **19 Claims**



1. In a motor, the combination comprising
a nonconductive brush housing;
a conductive brush holder located in said brush housing, said brush holder for holding a brush for movement along a predetermined axis, said brush holder including a conductive tab extending outside of said brush housing;
a wire guide is located adjacent said brush housing for guiding a field winding to said tab along a predetermined path which includes a portion extending generally parallel to said predetermined axis;

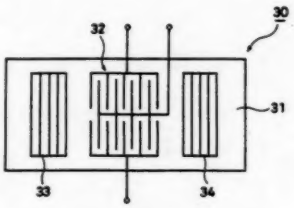
means for electrically coupling said field winding to said tab.

5,184,042

SURFACE WAVE DEVICE

Michio Kadota, and Kazuhiko Morozumi, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 16, 1991, Ser. No. 701,221
Claims priority, application Japan, May 21, 1990, 2-131592
Int. Cl.[5] H01L *41/03*
U.S. Cl. 310—313 A **8 Claims**



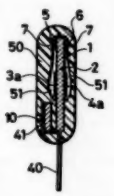
1. A surface wave device comprising:
a piezoelectric substrate made of a piezoelectric material; and
electrodes for exciting in said piezoelectric substrate a surface wave of an SH type whose displacement is mainly displacement in the direction perpendicular to the direction of the surface wave propagation,
said piezoelectric substrate being made of a piezoelectric material whose ratio of the elastic stiffness constant C_{33}^{D} to the elastic stiffness constant C_{44}^{E} is more than 4.

5,184,043

PIEZOELECTRIC RESONATOR

Takashi Yoshinaga, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 622,745, Dec. 5, 1990, abandoned. This application Dec. 17, 1991, Ser. No. 808,983
Claims priority, application Japan, Dec. 5, 1989, 1-140820[U]
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—320 **20 Claims**



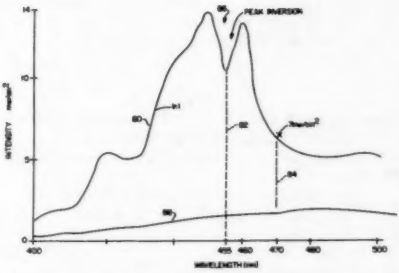
1. A method of producing an energy trapped type piezoelectric resonator vibrating in thickness expansion mode, said method comprising the steps of:
providing a substrate element having a front surface, a back surface and an upper edge, said front and back surfaces each having thereon a vibrating electrode part and a solder damping electrode which is between said upper edge and said vibrating electrode part and is in contact with no conductive part;
supporting said substrate by a downwardly protruding grounding electrode such that said front and back surfaces are substantially vertical and said upper edge is above said solder damping electrodes and said vibrating electrode parts on said front and back surfaces;
applying solder members on said solder damping electrodes on said front and back surfaces to thereby damp spurious vibrations of said substrate element;
causing a cavity forming material to drip from said upper edge slidingly over said solder damping electrodes and to thereby cover said vibrating electrode parts;
applying a sealing material over said front and back surfaces and over said cavity forming material covering said vibrating electrode parts; and
heating said sealing material so as to cause said cavity forming material to be absorbed by said sealing material and to thereby create a cavity between said vibrating electrode parts and said sealing material.

5,184,044

DENTAL CURING LAMP

Brian J. Thomas, Phoenix, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Aug. 13, 1990, Ser. No. 565,732
Int. Cl.[5] H01J *61/20*
U.S. Cl. 313—638 **16 Claims**



1. A low-watt metal halide discharge lamp for use in photocuring photo-curable compositions, comprising:
an envelope made of light transmissive material, having walls that define an arc chamber volume;
a fill of mercury, inert gas and a metal halide additive that includes an indium halide contained within said arc chamber volume, said mercury and said metal halide additive being adapted to vaporize during operation of said lamp and produce radiation energy that is maximized within the wavelength range between 400 and 500 nm;
a pair of electrodes, extending into said arc chamber volume, having electrode tips spaced apart from one another by a predetermined distance within said arc chamber volume; and
a pair of inlead assemblies electrically coupled to said pair of electrodes respectively and passing from said electrodes through a sealed section in said envelope to the exterior of said lamp;
wherein said lamp has a power input rating of not more than 35 watts, and said lamp contains amounts of indium halide and of mercury sufficient to cause an operating vapor pressure high enough to result in a spectral line reversal at the principal spectral line of said indium halide, and a broadband radiation in said range of 400–500 nm.

5,184,045

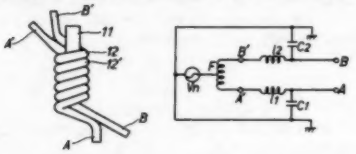
MAGNETRON FOR A MICROWAVE OVEN HAVING A PAIR OF CHOKE COILS WOUND AROUND A CORE IN THE SAME DIRECTIONS

Jong H. Im, Daeku, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 20, 1990, Ser. No. 511,756
Int. Cl.[5] H01J *23/14*
U.S. Cl. 315—39.51 **2 Claims**

1. A magnetron for a microwave oven, comprising,
a core;
a pair of choke coils wound around said core, both choke coils are wound in the same direction as a noise flowing

direction of radio frequency noise generated from an operating space through a filament to a pair of input terminals for making a pair of output terminals disposed at one end portion thereof and said pair of input terminals disposed at another end portion thereof so that input currents to said pair of input terminals are inverse to each other in



their flowing direction at a position where they pass through the core and noises are the same in their flowing direction; and

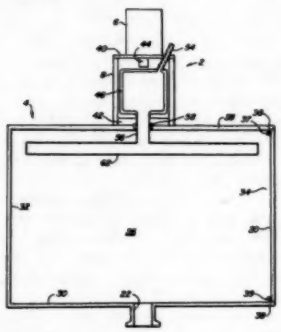
a filter circuit constituted by connecting said input terminals of said choke coils to a lead-through capacitor and by connecting said output terminals of said choke coils to a center lead and a peripheral lead, respectively.

5,184,046

CIRCULAR WAVEGUIDE PLASMA MICROWAVE STERILIZER APPARATUS

Bryant A. Campbell, Los Gatos, Calif., assignor to Abtox, Inc., Pleasanton, Calif.

Filed Sep. 28, 1990, Ser. No. 589,511
Int. Cl.[5] H05H *1/46*; A61L *2/00*
U.S. Cl. 315—111.21 **3 Claims**



1. An apparatus for plasma sterilization comprising:

a sterilization chamber;

a plasma container made of a material transparent to an electromagnetic radiation, said plasma container having a gas inlet for admitting a plasma generation gas and a plasma product outlet conduit for passing plasma gas products into said sterilization chamber;

at least one microwave plasma generator for producing plasma gas products in said plasma container, said microwave plasma generator further comprising:

a magnetron for generating electromagnetic radiation,

a cylindrical metal waveguide enclosing said plasma container for guiding the electromagnetic radiation thereto, and

an axially concentric magnetron antenna extending into the cylindrical waveguide for feeding the electromagnetic radiation from the magnetron to the cylindrical waveguide.

5,184,047

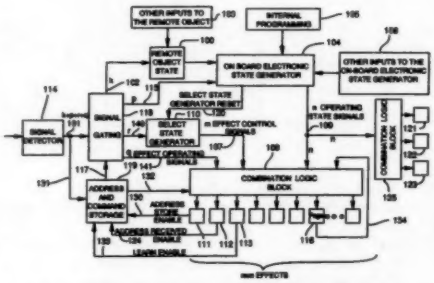
Patent Not Issued For This Number

5,184,048

MODEL RAILROAD REVERSING MOTOR CONTROL SYSTEM

Frederick E. Severson, 945 SW. Perfecta Ave., Beaverton, Oreg. 97005, and Patrick A. Quinn, 20195 SW. Imperial Dr., Aloha, Oreg. 97006

Division of Ser. No. 37,721, Apr. 13, 1987, Pat. No. 4,914,431, which is a continuation-in-part of Ser. No. 672,397, Nov. 16, 1984, abandoned. This application Feb. 14, 1990, Ser. No. 480,078
Int. Cl.[5] H02P *1/00*
U.S. Cl. 318—280 **13 Claims**



1. A reversing motor control circuit for use in a model train system having a track coupled to an interruptable electric power source for providing a track power signal, the circuit comprising:

input means for receiving the track power signal;

a pair of flip-flop circuits interconnected to form a clocked ring counter for indicating a present state that is one of a predetermined sequential series of states, the counter having a clock input for receiving a clocking signal to change the present state to a next one of the series of states;

clocking means coupled to the input means and to the clock input for providing the clocking signal to change the counter state to a next one of the series of states in response to an interruption in the track power signal having a duration of at least a predetermined clocking period;

a first logic gate coupled to the counter to decode the flip-flop outputs to form a forward signal;

a second logic gate coupled to the counter to decode the flip-flop outputs to form a reverse signal; and

power control means coupling the input means to the motor and responsive to the forward signal for driving the motor in a forward direction and responsive to the reverse signal for driving the motor in a reverse direction.

5,184,049

MOTOR BRAKE CONTROL CIRCUIT FOR REDUCING MOTOR STOPPING TIME

Hiroyuki Kiuchi, Komagane, Japan, assignor to Sankyo Seiki Mfg. Co., Ltd., Nagano, Japan

Filed Jun. 6, 1991, Ser. No. 711,301
Claims priority, application Japan, Jun. 22, 1990, 2-164537
Int. Cl.[5] H02P *3/00*
U.S. Cl. 318—362 **10 Claims**

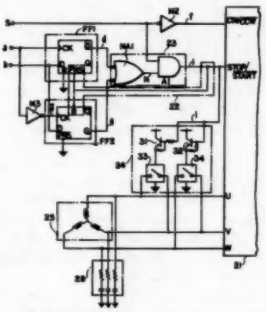
1. A motor brake control circuit comprising:

a first discriminator circuit for detecting the sense of rotation of the motor by applying a rotational signal having a value proportional to the rate of rotation of the motor; a second discriminator circuit for detecting the sense of rotation of the motor by applying an inverted signal of said rotational signal;

a sense-of-rotation directing circuit for controlling the motor drive circuit and reversing the sense of rotation of

the motor whenever a brake command is given to the motor;

a brake circuit for turning off the power being supplied to the motor coil whenever a change in the signals from the first and second discriminator circuits is detected for the



first time after the reversal of the sense of rotation of the motor; and

coil short circuit means for short-circuiting power terminals of the motor coil the instant the brake signal is issued from the brake circuit.

5,184,050

SUNROOF MOTOR WITH ROOF LID POSITION DETECTOR

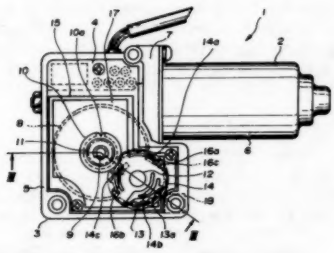
Naoto Harada; Shuji Sekine; Takeo Furuya, and Nobuo Yoshioka, all of Yokohama, Japan, assignors to Jidosha Denki Kogyo K.K., Yokohama, Japan

Filed Jan. 8, 1992, Ser. No. 818,095

Claims priority, application Japan, Jan. 11, 1991, 3-000480[U]

Int. Cl.[5] B60J *7/05*

U.S. Cl. 318—467 **3 Claims**



1. A sunroof motor comprising:

a motor part for rotating an output shaft forwardly and reversely;

a roof lid detective disc to be turned according to the rotation of said output shaft as much as an angle in proportion to an amount of movement of a roof lid driven by the forward and reverse rotation of said output shaft;

a contact plate disposed on a face of said roof lid detective disc and provided with a plurality of contacts; and

a printed wiring board disposed opposite to the face of said roof lid detective disc, formed with a motor driving circuit and mounted with a relay to supply or shut off the electric power to the motor part;

said motor driving circuit of the printed wiring board being provided with a plurality of board-side contacts for detecting the roof lid to arrive at predetermined positions on bases of electrical contact with said contacts of the contact plate and shutting off the electrical power to the motor part through said relay.

5,184,051

METHOD FOR PROGRAM CONTROL FOR AN INDUSTRIAL ROBOT FOR AUTOMATIC COATING OF WORKPIECES

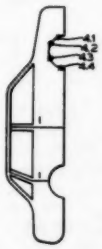
Werner Schweiker, and Volker Leininger, both of Grenchen, Switzerland, assignors to Behr-Industrieanlagen GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 60,726, Jun. 10, 1986, abandoned. This application Jan. 3, 1989, Ser. No. 293,564

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1986, 3619429

Int. Cl.[5] G05B *19/42*; B67D *5/08*

U.S. Cl. 318—568 **12 Claims**



1. A method of program control of a moving device having a coating unit for automatically coating workpieces, the method including the steps of; manually moving the moving device and its coating unit and producing a movement program for the moving device with storage of local parameters of the coating device for selected impingement points and storage of information regarding the necessary amount of paint and other coating parameters for each selected paint impingement points where process parameters changes are carried out, establishing an address for each paint impingement point, and producing and maintaining a parameter file separate from the movement program containing in tabulated form coded addresses corresponding to the addresses of the paint impingement points and the stored coating parameters for each of the paint impingement points.

5,184,052

COOPERATIVE OPERATION SYSTEM FOR NUMBERICAL CONTROL APPARATUS

Yoshiaki Ikeda, Minamitsuru, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP90/00936, § 371 Date Mar. 25, 1991, § 102(e) Date Mar. 25, 1991, PCT Pub. No. WO91/03010, PCT Pub. Date Mar. 7, 1991

PCT Filed Jul. 20, 1990, Ser. No. 668,515

Claims priority, application Japan, Aug. 18, 1989, 1-212492

Int. Cl.[5] G05B *19/18*

U.S. Cl. 318—569 **5 Claims**

1. A cooperative operation system for a plurality of numerical control apparatuses (CNCs), wherein each of said CNCs comprises:

a CNC control unit:

a switching circuit connected to said CNC control unit for switching an I/O signal used in said CNC control unit;

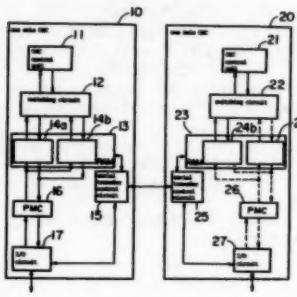
a RAM connected to said switching circuit for storing said I/O signal;

a programmable machine controller (PMC) connected to said RAM;

an I/O circuit connected to said PMC; and

a serial transfer control circuit connected to said I/O circuit

and said RAM for transferring the I/O signal to another CNC, wherein said PMC receives or transmits an I/O



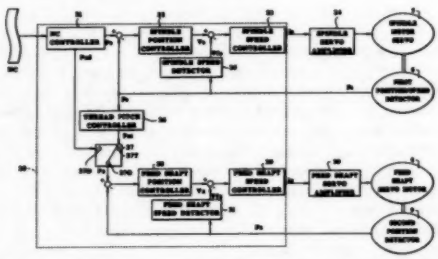
signal of said another CNC through said serial transfer control circuit.

5,184,053

CONTROL DEVICE FOR A TOOL DRIVING UNIT

Satoshi Maruo, Gifu; Chikamasa Hattori, Ichinomiya, and Fumio Kameyama, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 2, 1991, Ser. No. 679,101
Claims priority, application Japan, May 31, 1990, 2-144029
Int. Cl.[5] G05B *19/18*
U.S. Cl. 318—571 **22 Claims**



1. A control device for a tool driving unit wherein a tool mounted at a front end of a spindle is controlled to be rotated around a central axis of the spindle and to be longitudinally fed along the central axis of the spindle by said control device, said control device being controlled by a single microcomputer which outputs a spindle current command for driving a spindle motor to rotate the tool and a feed shaft current command for driving a feed shaft servo motor to longitudinally feed the tool, said single microcomputer comprising:

spindle position control means for detecting a first angular position of said spindle servo motor, determining a first positional difference between said first angular position and a spindle command, and outputting a spindle speed command for said spindle servo motor based on said first positional difference;

spindle speed control means for detecting a first rotational speed of said spindle servo motor, determining a first speed difference between said first rotational speed and said spindle speed command, and outputting said spindle current command based on said first speed difference;

feed shaft position control means for detecting a second angular position of said feed shaft servo motor, determining a second positional difference between said second angular position and a selected feed shaft command, and outputting a feed shaft speed command for said feed shaft servo motor based on said second positional difference; and

feed shaft speed control means for detecting a second rotational speed of said feed shaft servo motor, determining a second speed difference between said second rotational speed and said feed shaft speed command, and outputting said feed shaft current command based on said second speed difference;

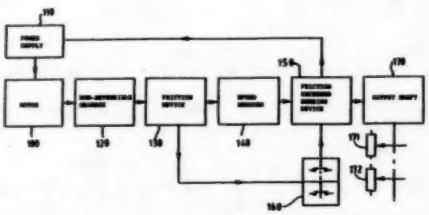
wherein said single microcomputer operates according to a time-division mode of operation so that said spindle position control means and said feed shaft position control means are repeatedly alternately operated, and said spindle speed control means and said feed shaft speed control means are repeatedly alternately operated.

5,184,054

FRICTION ACTUATOR

Jacques Delattre, Valpuiseaux; Philippe Gouze, Villemoisson, and Jacques Neuvessel, Neuilly S. Seine, all of France, assignors to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.), Massy- Cedex, France

Filed Sep. 24, 1991, Ser. No. 764,321
Claims priority, application France, Sep. 24, 1990, 90 11740
Int. Cl.[5] B64C *27/82*
U.S. Cl. 318—586 **5 Claims**



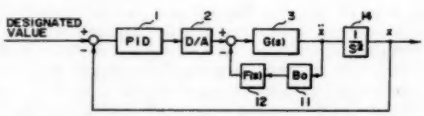
1. Actuator comprising a direct current motor driving a friction device through a non-reversible gearbox, said friction device connected to a speed reducer driving an output shaft of said motor, said friction device disposed between said non-reversible gearbox and said speed reducer and a friction exceeded sensing device disposed between said speed reducer and said output shaft adapted to cut off a supply of power to said motor.

5,184,055

DEVICE FOR POSITIONING CONTROL

Shinji Ohishi, Yokohama; Kotaro Akutsu, Machida, and Toshikazu Sakai, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 592,982
Claims priority, application Japan, Oct. 6, 1989, 1-260276; Jun. 14, 1990, 2-153894
Int. Cl.[5] G05B *5/01*
U.S. Cl. 318—615 **14 Claims**



1. A device for positioning control, comprising:

a movable table;

an acceleration sensor disposed on said movable table for producing an acceleration signal;

a feedback loop for providing a control signal to control movement of said movable table; and

an acceleration feedback loop for receiving the acceleration signal produced by said acceleration sensor, wherein said acceleration feedback loop is provided as an internal loop to said feedback loop, said acceleration feedback loop comprising a filter circuit comprising a second-order low-pass filter.

5,184,056

METHOD OF REGULATING THE TORQUE RESPONSE OF A MULTIPHASE ELECTRONICALLY COMMUTATED ELECTRIC MOTOR

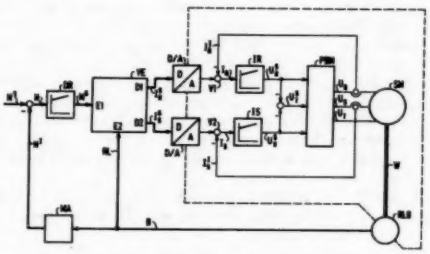
Richard Brune, Fuerth; Wolfgang Papiernik, and Güenter Rochholz, both of Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 450,682

Claims priority, application European Pat. Off., Jan. 13, 1989, 89100599.3

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—799 **21 Claims**



1. A method for regulating the torque response of a multiphase electronically commutated electric motor comprising:

generating a torque-regulating variable;

providing a rotor position signal;

forming from said rotor position signal a rotor-position dependent signal for each phase to be regulated, the rotor-position dependent signals being selected to compensate for the differences between the actual torque and the ideal torque at each rotor position resulting form the manufacture of said electric motor;

combining the torque-regulating variable with each of said rotor-position dependent signals to form a nominal current value for each current phase;

forming a current-regulating value from the difference between the instantaneous nominal current value and the instantaneous actual current value; and

generating a nominal voltage corresponding to said current-regulating value for each current phase and using said nominal voltages to control the electric motor using a pulse width modulator.

5,184,057

CONTROL METHOD AND DEVICE FOR AC MOTOR

Keijiro Sakai; Tunehiro Endo, both of Hitachiohta; Yuzuru Kubota; Takashi Ikimi, both of Hitachi; Nobuyoshi Mutoh, and Mitsuyuki Honbu, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

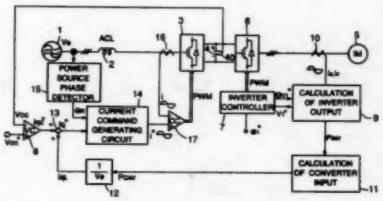
Filed Sep. 13, 1990, Ser. No. 581,898

Claims priority, application Japan, Sep. 14, 1989, 1-238446; Feb. 23, 1990, 2-42783; May 1, 1990, 2-115516

Int. Cl.[5] H02P *5/40*

U.S. Cl. 318—803 **41 Claims**

1. A control method for an AC motor designed, in transforming output power of a converter to AC power by an inverter for driving said AC motor with the AC power, to detect an AC current in the inverter output side and a Dc voltage in the inverter input side, calculate an inverter input average current for an integer multiple of a carrier half-cycle from said detected current, calculate input power of said inverter from said calculated average current and said detected DC voltage, produce a source current value by dividing said calculated input power by the AC voltage in the converter input side, produce a source current command value from said detected DC voltage in the inverter input side and an output voltage command indicating the target output voltage of said



converter for restraining the deviation therebetween to become zero, modify said source current command value in accordance with said source current value, and apply a pulse signal based on said modified source current command value to said converter for controlling said converter so that an AC current in the converter input side follows said modified source current command value.

5,184,058

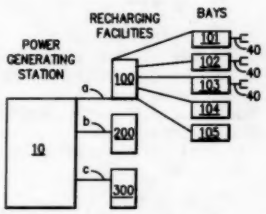
METHOD AND SYSTEM FOR ELECTRICITY STORAGE AND DISCHARGE

Bradley J. Hesse, Syracuse, and Philip J. Gentile, East Syracuse, both of N.Y., assignors to The Fleming Group, Syracuse, N.Y.

Filed May 20, 1991, Ser. No. 703,231

Int. Cl.[5] H02J *7/00*

U.S. Cl. 320—4 **14 Claims**



6. A method of recharging electrically driven vehicles, comprising the steps of:

a) drawing power from a main power generating plant during hours of off-peak demand;

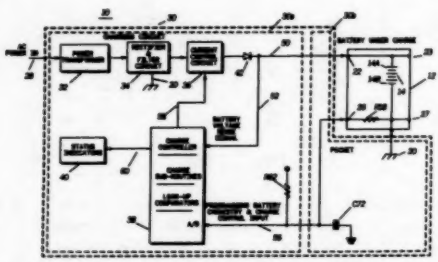
b) transforming and rectifying said power for storage in a bank of capacitors each located at one of a plurality of recharging facilities disposed along travelled routes of said electrically driven vehicles, said recharging facilities having a number of recharging bays for recharging individual electrically driven vehicles; and

c) discharging the power stored in said bank of capacitors to electrically driven vehicles each disposed in respective ones of said recharging bays.

5,184,059
EXPANDED BATTERY CAPACITY IDENTIFICATION SCHEME AND APPARATUS

Joseph Patino; Jose M. Fernandez, both of Plantation, and Henry A. Bogut, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 16, 1991, Ser. No. 760,413
Int. Cl.[5] H01M *10/44*
U.S. Cl. 320—15 **15 Claims**

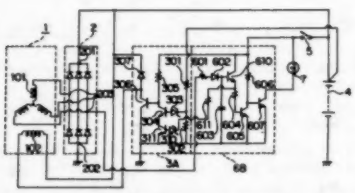


1. A battery charging system including a charging path for charging batteries, the system comprising:
- a charging algorithm sensing circuit;
- at least one battery cell having a positive terminal, a negative terminal, and a predetermined charging algorithm;
- resistance means for providing a resistance value, the resistance means comprising two terminals, the resistance value related to the predetermined charging algorithm of the cell;
- an identification capacitor having a stabilizing time coupled with the resistance means and coupled to one of the terminals of the battery cell to form a time constant related to the predetermined charging algorithm; and;
- the charging algorithm sensing circuit further comprising:
  - means for providing an electrical current in the resistance means after the time constant;
  - means for periodically measuring the voltage developed across the resistance means until the voltage has stabilized, after the stabilizing time;
  - means for measuring the stabilizing time; and
  - means for converting the measured stabilizing time to a predetermined identifiable battery usage.

5,184,060
CONTROL APPARATUS FOR AN AC GENERATOR

Shiro Iwatani, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1991, Ser. No. 709,845
Claims priority, application Japan, Jun. 18, 1990, 2-157480
Int. Cl.[5] H02K *11/00;* **H02H** *7/06*
U.S. Cl. 322—99 **4 Claims**

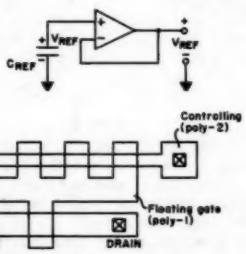


1. A control apparatus for an AC generator (1) having a field coil (102) and an armature coil (101) which provides a generation signal during power generation of the generator, said control apparatus comprising:
- a rectifier (2) connected to the generator for rectifying the output voltage thereof;
- a storage battery (4) connected to the field coil of the generator for supplying a current to the field coil, said battery also being connected through said rectifier to the armature coil of the generator so as to be charged by the generator through said rectifier;
- a voltage regulator (3; 3A) connected between the generator and said battery for controlling the current supply from said battery to the field coil, said voltage regulator including a switch connected in series with the field coil of the generator for turning on and off the current supply from said storage battery to the field coil so as to control the output voltage of the generator to a predetermined value; and
- a detector (6A; 6B) connected between the armature coil of the generator and said storage battery and between said rectifier and said storage battery for detecting an operating state of the generator and operating an indicator (7) so as to indicate the detected operating state of the generator;
- said detector comprising means for preventing a significant battery leakage and discharge current flow through the detector upon the deterioration or failure of a rectifier diode, said preventing means comprising:
- an indicator switch (605, 607) for turning said indicator on and off;
- an emitter follower transistor (610) having an input terminal connected through a high impedance and the rectifier to the armature coil of the generator, and an output terminal connected to said indicator switch for controlling said indicator switch based on the generation signal from the armature coil; and
- a relatively low value capacitor (603) connected to said emitter follower transistor for smoothing the generation signal from the armature coil.

5,184,061
VOLTAGE REGULATOR FOR GENERATING A CONSTANT REFERENCE VOLTAGE WHICH DOES NOT CHANGE OVER TIME OR WITH CHANGE IN TEMPERATURE

Bang-Wan Lee, Kyungmung-city, and Yi-Sung Bae, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suweon City, Rep. of Korea

Filed May 30, 1991, Ser. No. 708,285
Claims priority, application Rep. of Korea, Mar. 27, 1991, 91-4830
Int. Cl.[5] G05F *1/46, 1/567*
U.S. Cl. 323—265 **5 Claims**



1. A voltage regulator circuit comprising:
- an operational amplifier including an inverting terminal, a non-inverting terminal, and an output terminal electrically connected to said inverting terminal; and
- a capacitor including a floating gate, a controlling gate, and an isolating layer, said capacitor being connected to the non-inverting terminal of said operational amplifier and having a programmed reference voltage charge stored therein,

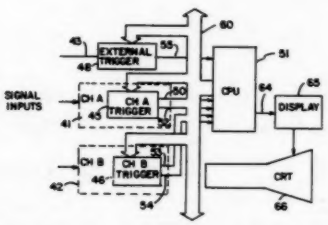
wherein said operational amplifier receives and outputs said reference voltage charge which is unaffected by changes in temperature.

5,184,062

DYNAMICALLY CALIBRATED TRIGGER FOR OSCILLOSCOPES

Gregory J. Ladwig, Madison, Wis., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed May 11, 1990, Ser. No. 522,181
Int. Cl.[5] G01R *13/28, 35/00*
U.S. Cl. 324—74 **38 Claims**



10. A method of calibrating a trigger signal channel of an oscilloscope which receives a trigger signal at an input and operates on it to provide a conditioned trigger signal having a gain and offset, the conditioned trigger signal being provided to one input of a comparator, with the other input of the comparator receiving a reference voltage against which the trigger signal is compared, wherein the comparator changes its output state as the trigger signal to the comparator goes through the reference voltage level, comprising the steps of:

(a) providing the output voltage of a gain digital-to-analog converter which converts a digital input word to an analog output voltage to a level digital-to-analog converter which receives the analog voltage output of the gain digital-to-analog converter as its reference input, and providing the analog output of the level digital-to-analog converter to the reference input of the comparator, the analog output of the level digital-to-analog converter voltage determined by the digital input word provided to it and the reference voltage from the gain digital-to-analog converter;

(b) applying a calibration signal to the input of the trigger signal channel which changes periodically and linearly between known high and low voltage values and which has zero offset to provide a conditioned calibration signal;

(c) applying a digital input to the gain digital-to-analog converter to provide an upper limit output voltage from the gain digital-to-analog converter which is applied to the level digital-to-analog converter;

(d) applying a digital input to the level digital-to-analog converter which is at a value at which the output voltage of the level digital-to-analog converter will be in about the middle of its output range such that the output of the comparator is changing states;

(e) changing the value of the digital data provided to the level digital-to-analog converter until its output voltage is at a level at which the trigger comparator stops changing states at a voltage level which is at the maximum of the conditioned calibration signal and storing the digital input value at this maximum as a top digital data value;

(f) changing the digital data value provided to the level digital-to-analog converter until its output voltage is at a level at which the comparator stops changing states at the minimum of the conditioned calibration signal and storing the digital input value at this minimum as a bottom digital data value;

(g) subtracting the bottom digital data value from the top digital data value and comparing the difference with a full desired digital input range of the level digital-to-analog converter and determining whether the difference is equal to the full desired digital input range of the level digital-to-analog converter, and, if not, then

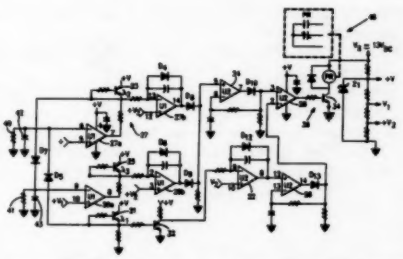
(h) changing the value of the digital input to the gain digital-to-analog converter and repeating steps (b) through (g) above until the difference between the top and bottom input values is equal to the desired digital input range and then stopping and storing the value of the input to the gain digital-to-analog converter at that time as the gain correction count, and using that gain correction count as the input to the gain digital-to-analog converter for subsequent operation of the oscilloscope where the oscilloscope is triggering on a signal provided to the input of the trigger channel.

5,184,063

THREE PHASE REVERSAL DETECTION SYSTEM

Virgil E. Eisenhauer, Camillus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 13, 1992, Ser. No. 834,748
Int. Cl.[5] G01R *25/00;* **H02H** *3/18, 3/26*
U.S. Cl. 324—86 **3 Claims**



1. A polyphase line signal reversal detection system comprising:

at least first, second, and third input signal coupling means coupled to the polyphase line signal for generating respective output waveforms indicative of the input signals;

a first integrating circuit means having an integrating means coupled to said first and second input signal coupling means and responsive to the respective output waveforms for generating a first peak integrated signal, said first peak integrated signal is initiated during the positive half cycle of the first output waveform only when the second output waveform is in the negative half cycle and said first peak integrated signal is terminated when the second output waveform starts the positive half cycle;

a second integrating circuit means having an integrating means coupled to said second and third input signal coupling means and responsive to the respective output waveforms for generating a second peak integrated signal, said second peak integrated signal is initiated during the positive half cycle of the second output waveform only when the third output waveform is in the negative half cycle and said second peak integrated signal is terminated when the third output waveform starts the positive half cycle;

a reference integrating circuit means having an integrating means coupled to said first waveform coupling means and responsive to the first output for generating a reference integrated signal, said reference integrated signal is initiated at the start of the positive half cycle of the first output waveform and is terminated at the start of the negative half cycle of the first output waveform; and

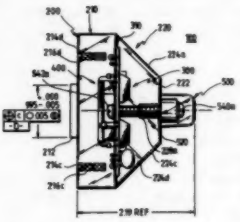
a comparator circuit means for comparing said first peak integrated signal, said second integrated signal, and said reference integrated signal, for providing an output indication signal of the phase sequence of the polyphase line signal.

5,184,064

ENCAPSULATED METER WITH OPTICAL PROGRAMMER

Bruce A. Vicknair, Baytown, and Robert A. Baten, Houston, both of Tex., assignors to Stewart & Stevenson Services, Inc., Houston, Tex.

Filed Mar. 25, 1991, Ser. No. 675,368
Int. Cl.[5] G01R *1/04, 21/00;* **H05K** *5/06;* **G01D** *11/24*
U.S. Cl. 324—156 **23 Claims**



1. A meter, comprising:

optically programmable means for accumulating totals of a measured quantity;

means for displaying totals accumulated by said programmable means; and

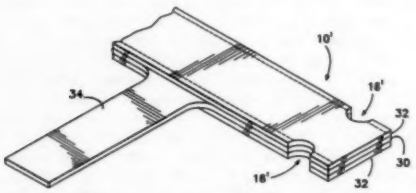
optically transparent housing means in the form of a transparent aliphatic resin or epoxy resin molded around and completely encapsulating said programmable means and said displaying means, said programmable and displaying means being embedded in said housing means.

5,184,065

TWIST LOCK PROBE TIP

Warren L. Chism, Vancouver, Wash., assignor to Tektronix, Inc., Wilsonville, Oreg.

Division of Ser. No. 416,792, Oct. 2, 1989, abandoned. This application Oct. 7, 1991, Ser. No. 772,751
Int. Cl.[5] G01R *1/06*
U.S. Cl. 324—158 P **4 Claims**



1. A twist lock probe tip for an electrical test probe comprising:

a flat elongate body of an insulating material having opposing notches formed therein for engaging leads of an integrated circuit device; and

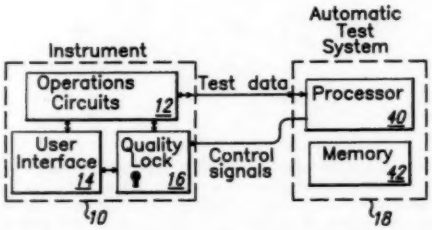
a conductor coated on one of the surfaces of the flat elongate body with the conductor exposed within the notches for making electrical contact with one of the leads of the integrated circuit device, the other lead being in contact with the insulating elongate body.

5,184,066

METHOD AND APPARATUS FOR DISABLING ALL OPERATIONS OF AN ELECTRONIC INSTRUMENT EXCEPT FOR AN AUTOMATIC TEST PROCEDURE

Alexander McEachern, Oakland; Jamie Nicholson, Foster City, and Craig S. Waterman, San Francisco, all of Calif., assignors to Basic Measuring Instruments, Foster City, Calif.

Filed Apr. 24, 1991, Ser. No. 690,507
Int. Cl.[5] G01R *31/02;* **G06F** *11/00*
U.S. Cl. 324—158 R **7 Claims**



3. An electronic instrument which is tested by an automatic test system that performs a quality test of a plurality of operating characteristics of the instrument, the instrument including a quality lock device, the quality lock comprising:

a) means for coupling the instrument to the automatic test system including an instrument-to-test-system communication link wherein the instrument-to-test-system communication link is never disabled even though the instrument may be decoupled from the test system;

b) means for disabling operation of the instrument exclusive of the instrument to test system communication link until the instrument has passed the quality test, wherein the means for disabling operation is coupled to the instrument through the means for coupling;

c) means for disabling electronic communication between the instrument and any external circuit exclusive of the instrument to test system communication link until the instrument has passed the quality test, wherein the means for disabling electronic communication is coupled to the instrument through the means for coupling;

d) means for enabling operation of the instrument after the instrument has passed the quality test, wherein the means for enabling operation is coupled to the instrument through the means for coupling;

e) means for enabling electronic communication between the instrument and any external circuit after the instrument has passed the quality test, wherein the means for enabling electronic communication is coupled to the instrument through the means for coupling;

f) means for periodically disabling operation of the instrument exclusive of the instrument to test system communication link until the instrument has repassed the quality test, wherein the means for periodically disabling is coupled to the means for disabling; and

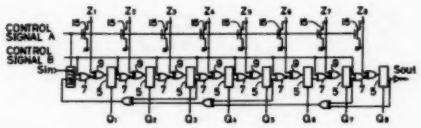
g) means for periodically disabling electronic communication between the instrument and any external circuit exclusive of the instrument to test system communication link until the instrument has repassed the quality test, wherein the means for periodically disabling electronic communication is coupled to the means for disabling electronic communication.

5,184,067

SIGNATURE COMPRESSION CIRCUIT

Yasuyuki Nozuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 378,919, Jul. 12, 1989, abandoned. This application Nov. 26, 1991, Ser. No. 799,719
Claims priority, application Japan, Jul. 12, 1988, 63-171906
Int. Cl.[5] G01R *31/00, 31/28*
U.S. Cl. 324—158 R 8 Claims



1. A test circuit comprising:

a signature compression circuit having a plurality of flip-flops connected in series to each other with gate circuits interposed between adjacent flip-flops, said gate circuits being connected to a first common signal line and coupled respectively to all output nodes of a logic circuit to be tested to receive outputs of said logic circuit, each gate circuit carrying out a logical operation on one output of said logic circuit and an output of one flip-flop to carry out signature compression of an output pattern including outputs of said logic circuit when a first common signal level on said first common signal line is signalled, each gate circuit supplying said outputs of said logic circuit respectively to said flip-flops and isolating said flip-flops from each other to output said outputs of said logic circuit through said signature compression circuit when said first common signal level is not signalled; and

a plurality of transistors connected between at least one node at a logical level and said output nodes of said logic circuit respectively, gate terminals of said transistors being connected to a second common signal line such that said transistors are turned on at the same time and all of said output nodes of said logic circuit are forced to be at said logical level in accordance with a second common signal level of said second common signal line, wherein said gate circuits enable shift operation of said signature compression circuit to shift out a test pattern stored in said flip-flops when said second common signal level is signalled on said second common signal line.

5,184,068

ELECTRONIC DEVICE TEST HANDLER

Ray G. Twigg; Mark W. Klug, both of San Diego; Santino Marrone, Poway, and Malcolm V. Hawkes, San Diego, all of Calif., assignors to Symtek Systems, Inc., San Diego, Calif.

Continuation of Ser. No. 587,218, Sep. 24, 1990, abandoned. This application Mar. 2, 1992, Ser. No. 845,744
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 F 14 Claims

1. A device for presenting electronic devices to a tester for testing comprising:

(a) a plurality of carriers each for carrying a set of electronic devices,

(b) a loading stage,

(c) a pre-test chamber,

(d) a test stage,

(e) a post-test chamber,

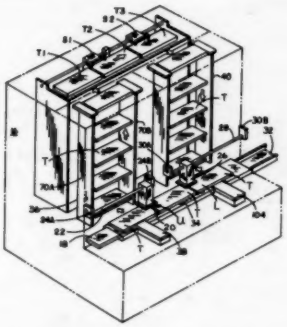
(f) an unloading stage,

(g) means for loading a set of electronic devices onto each carrier when a carrier is at the loading stage,

(h) means for unloading a set of electronic devices from each carrier when a carrier is at the unloading stage,

(i) means for providing electrical contact between the tester and a set of electronic devices carried by a carrier when a carrier is at the test stage, and

(j) means for cyclically conveying the plurality of carriers in a closed loop from the loading stage through the pre-test chamber, from the pre-test chamber to the test stage, from the test stage to the post-test chamber, through the post-test chamber to the unloading stage, and from the unloading stage to the loading stage, each carrier being paused at the loading stage long enough to have a set of electronic devices loaded onto it, each carrier being paused at the test stage long enough for desired tests to be performed on the set of electronic devices carried by the carrier, each carrier being paused at the unload stage long enough for it to be unloaded of electronic devices.

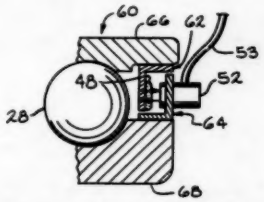


5,184,069

ROTATIONAL SPEED SENSOR UTILIZING MAGNETIC INK TONE RING

Jonathan M. Adler, Ypsilanti; Russell E. Monahan, Ann Arbor, and Robert W. Frayer, Jr., Gregory, all of Mich., assignors to NTN Technical Center, (U.S.A.) Inc., Ann Arbor, Mich.

Filed Dec. 3, 1991, Ser. No. 802,125
Int. Cl.[5] G01B *7/14;* G01P *3/48*
U.S. Cl. 324—207.22 14 Claims



1. A rotation sensor for detecting relative rotation between two components which are coupled by an anti-friction bearing, comprising:

a tone ring defined by a layer of magnetic ink, said layer defining multiple magnetic poles, said tone ring fixed relative to one of said components, and

a transducer fixed relative to the other of said components positioned relative to said tone ring such that relative rotation between said components causes a varying magnetic field to interact with said transducer.

5,184,070

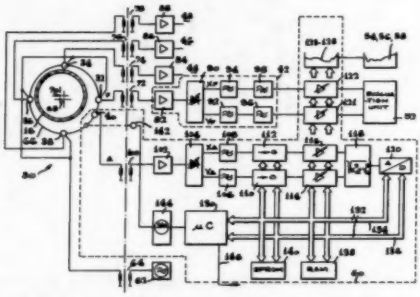
EDDY-CURRENT DEFECT TEST INSTRUMENT WITH MULTIPLE TEST PROBES AND ONE DISTANCE PROBE

Herman Besendorfer, Altenriet; Gunter Stritzke, Gomaringen, and Franz Haditsch, Reutlingen, all of Fed. Rep. of Germany, assignors to Institut Dr. Friedrich Forster Pruferatebau, Reutlingen, Fed. Rep. of Germany

Filed Jan. 29, 1991, Ser. No. 647,752

Int. Cl.[5] G01R *33/12*; **G01N** *27/72, 27/82*

U.S. Cl. 324—225 **16 Claims**



1. An eddy-current test instrument having a rotary head provided with at least two test heads including eddy-current test probes offset mounted along a circular track for scanning a part to be tested; signal processing devices by means of which defect signals in the test probes are derived from defects in the part to be tested and wherein such defect signals are further processed; evaluation units wherein defect signals are evaluated; distance compensation devices wherein defect signals are compensated with respect to the distance h between the test probes and the part to be tested, including a distance probe wherein a distance signal is derived from the distance h, a signal processing device wherein the distance signal is processed to a control signal, and control elements connected between the signal processing devices and the evaluation units, said control elements modifying the defect signals as a function of control signals, comprising:

a single distance probe and one signal processing device;

means for providing control signals derived during one revolution of the distance probe identifying the peripheral position of said distance probe and storing the control signals in a first table (I); and

means responsive to a test probe passing a peripheral position for retrieving the control signal for this peripheral position and for controlling the control element(s) belonging to the respective test probes of said test head by the retrieved control signals.

5,184,071

NON-DESTRUCTIVE EDDY CURRENT TEST DEVICE USING ADDITIVE FLUX SUBSTRACTIVE FLUX SWITCHING

Jean-Pierre Tasca, Sainte Genevieve Des Bois, France, assignor to Compagnie Generale D'Automatisme CGA-HBS, Bretigny-Sur-Orge, France

Filed Dec. 12, 1991, Ser. No. 805,962

Claims priority, application France, Dec. 28, 1990, 90 16469

Int. Cl.[5] G01N *27/90*; **G01R** *33/12*

U.S. Cl. 324—238 **3 Claims**

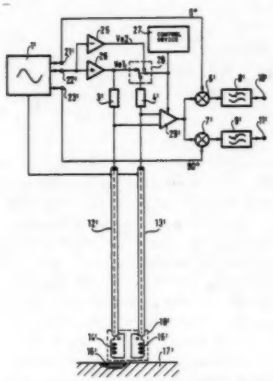
1. A non-destructive eddy current test device using additive flux/substractive flux switching, comprising:

a control means for selecting either additive flux or subtractive flux operation;

supplying means for supplying first and second excitation signals alternating at the same frequency but in phase opposition to one another;

two analogous coils adjacent one another and electromagnetically coupled to a part under test so as to create two fluxes therein when excitation signals are supplied to said coils;

feeding means controlled by said control means and connected to said supplying means and to said coils for feeding said excitation signals to said coils whereby each coil will have a terminal voltage corresponding to an impedance of the respective coil, said feeding means feeding said first excitation signal to said first coil and feeding either of said first or second excitation signals to said first coil in accordance with the selection by said control means; and



measuring means connected to said coils for measuring the difference between the impedances of said first and second coils, by either adding or subtracting the terminal voltages of said first and second coils in accordance with the selection by said control means.

5,184,072

APPARATUS FOR MEASURING WEAK STATIC MAGNETIC FIELD USING SUPERCONDUCTION STRIPS AND A SQUID MAGNETOMETER

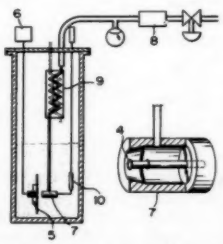
Junpei Yuyama, 2-28-2, Morinosato, Atsugi-shi, Kanagawa-ken; Qiquan Geng, Green-haimu-Inui 2-304, 64, Yahata, Chigasaki-shi, Kanagawa-ken; Kazunori Chihara; Hirofumi Minami, both of Chigasaki, and Eiichi Goto, Fujisawa, all of Japan, assignors to Research Development Corporation, Tokyo; Junpei Yuyama, Atsugi and Qiquan Geng, Ohigasaki, all of, Japan, a part interest

Filed Sep. 19, 1991, Ser. No. 762,381

Claims priority, application Japan, Sep. 20, 1990, 2-251494

Int. Cl.[5] G01R *33/02, 33/035*

U.S. Cl. 324—248 **6 Claims**



1. An apparatus for measuring a weak static magnetic field,

including a superconducting quantum interference device (SQUID) and a pick-up coil magnetically coupled thereto, said apparatus comprising:

an array of superconducting strips which are arranged in a plane and separated by narrow slits, and

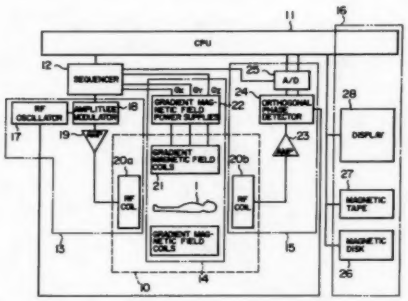
means for moving said array in a direction parallel to the plane and at a small distance from the pick-up coil.

5,184,073

METHOD FOR CORRECTING PHASE ERRORS IN A NUCLEAR MAGNETIC RESONANCE SIGNAL AND DEVICE FOR REALIZING SAME

Hiroyuki Takeuchi, Kashiwa; Tatsuo Nozokido, Sendai, and Chikako Nakamura, Matsudo, all of Japan, assignors to Hitachi Medical Corporation and Hitachi, Ltd., both of Tokyo, Japan

Filed Apr. 9, 1991, Ser. No. 682,472
Claims priority, application Japan, Apr. 9, 1990, 2-092233
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **14 Claims**



1. A method for correcting phase errors in a nuclear magnetic resonance signal comprising the steps of:

(a) measuring a first NMR signal in a pulse sequence, where at least neither phase encoding pulse nor frequency encoding pulse is applied to a body to be examined, directly before a normal measurement for obtaining an NMR signal for imaging is effected;

(b) obtaining a frequency spectrum for said first NMR signal and a first central frequency giving a peak of said frequency spectrum;

(c) effecting said normal measurement according to a predetermined pulse sequence;

(d) measuring a second NMR signal in a pulse sequence, where at least neither said phase encoding pulse nor said frequency encoding pulse is applied thereto, directly after said normal measurement;

(e) obtaining a frequency spectrum for said second NMR signal and a second central frequency giving a peak of said frequency spectrum;

(f) obtaining an amount of phase error for each of said NMR signals for imaging by using a difference between said first central frequency and said second central frequency and a measurement time for each of said NMR signals for imaging;

(g) correcting said phase error for each of said NMR signals for imaging; and

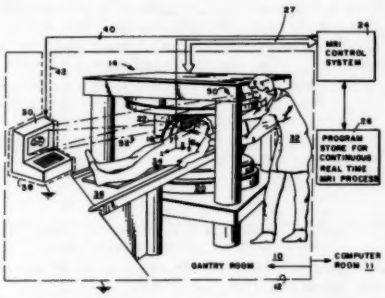
(h) reconstructing an image by using a signal corrected.

5,184,074

REAL-TIME MR IMAGING INSIDE GANTRY ROOM

Leon Kaufman, San Francisco; David M. Kramer, San Rafael; Barry McCarten, Palo Alto; Mitsuaki Arakawa, Hillsborough; Christine Hawryszko, San Mateo, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Feb. 4, 1991, Ser. No. 650,215
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **16 Claims**



1. A magnetic resonance imaging system comprising:

a shielded gantry room;

an MRI magnet with associated gradient coils, RF coils, patient transport and MRI viewing monitor all co-located within said shielded gantry room; and

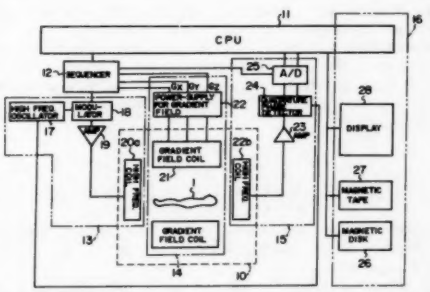
an MRI control system located outside said shielded gantry room and connected to said gradient coils, RF coils and viewing monitor and adapted to continuously perform MRI in real-time to provide on said viewing monitor within the shielded gantry room an automatically continuously updated image sequence of a patient image volume within said magnet.

5,184,075

METHOD AND APPARATUS FOR COMPENSATING FOR NONUNIFORMITY OF STATIC MAGNETIC FIELD IN MRI SYSTEM

Hiroshi Nishimura, Kashiwa, Japan, assignor to Hitachi Medical Corporation, Tokyo, Japan

Filed Jan. 29, 1991, Ser. No. 647,407
Claims priority, application Japan, Jan. 31, 1990, 2-019042
Int. Cl.[5] G01V *3/00*
U.S. Cl. 324—309 **10 Claims**



1. A method of compensating for nonuniformity of a static magnetic field in a nuclear magnetic resonance (NMR) imaging system, comprising the steps of:

(a) selecting one of X-, Y- and Z-axes of a Cartesian coordinate system as a phase encoding direction;

(b) selectively exciting a region of field of view by applying a high frequency pulse of $\alpha°$ to an object under inspection;

(c) measuring an NMR signal by applying a phase encoding gradient magnetic field and a frequency encoding gradient magnetic field after application of said high frequency pulse of $\alpha°$, the step (c) of measuring being performed a plurality of times while changing said phase encoding gradient magnetic field;

(d) detecting a peak value of the measurement data obtained by step (c) and determining a phase encoding quantity at which said peak value can be obtained;

(e) determining an intensity and a plurality of a linear component of nonuniformity components of the static magnetic field in said direction selected by obtaining an intensity and a polarity of said phase encoding gradient magnetic field corresponding to said peak value; and

(f) executing a pulse sequence for measuring the NMR signal by applying a gradient field added with a compensating gradient magnetic field having the same intensity as said linear component and a polarity opposite to that of said linear component to a gradient magnetic field applied in the selected direction.

5,184,076

MAGNETIC RESONANCE IMAGING COIL FOR APPLYING NMR AND ESR PULSES

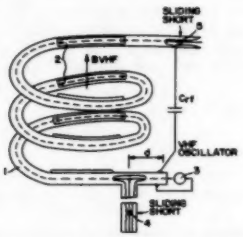
Gosta J. Ehnholm, Helsinki, Finland, assignor to Instrumentarium Corporation, Helsinki, Finland

Filed Apr. 4, 1991, Ser. No. 680,574

Claims priority, application United Kingdom, Apr. 4, 1990, 9007636

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—318 **15 Claims**



2. Magnetic resonance imaging apparatus comprising means for applying a magnetic field to a sample to be imaged, means for applying pulses of MR transition-exciting electromagnetic radiation to the sample, an NMR signal coil for detecting the resulting radiation from the sample, and means for applying pulses of electromagnetic radiation to the sample for stimulating coupled ESR transitions, characterized in that a pulse generating means is coupled to the NMR signal coil and antenna means is coupled to the coil and disposed at plural positions along the coil, whereby pulses for stimulating coupled ESR transitions may be transmitted from the pulse generating means through the coil to the antenna means and thence into the sample.

5,184,077

ABRASION-RESISTANT, HIGH PRESSURE DIELECTRIC SENSORS

David R. Day, Charlestown, and Farhad Bybordi, Topsfield, both of Mass., assignors to G-C Acquisition, Inc., Newton Centre, Mass.

Continuation of Ser. No. 505,236, Apr. 5, 1990, abandoned. This application Sep. 25, 1991, Ser. No. 766,956

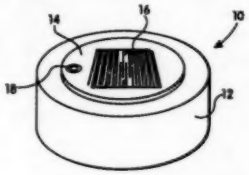
Int. Cl.[5] G01R *27/02*

U.S. Cl. 324—693 **18 Claims**

1. Apparatus for measuring the dielectric properties for an abrasive polymeric material during curing, the apparatus comprising:

an abrasion-resistant ceramic housing adapted for mounting within a vessel containing a polymeric material, the housing presenting at least one exposed surface to contact said material;

a first electrode disposed at said surface and exposed to make direct contact with the material; and



a second electrode also disposed at said surface and exposed in spaced-apart relationship to said first electrode to, likewise, make direct electrical contact with the material, said electrodes being flush-mounted with the exposed surface of the vessel and separated by a distance that permits measurement of the abrasive polymeric material's properties while minimizing boundary artifacts.

5,184,078

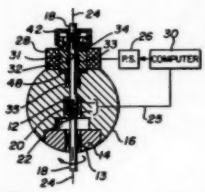
APPARATUS FOR ROTATING AN NMR TEST TUBE

Uri Rapoport, Oak Park, Ill., assignor to Elbit-ATI, Ltd., Oak Park, Ill.

Filed Mar. 8, 1991, Ser. No. 666,576

Int. Cl.[5] G01V *3/00*

U.S. Cl. 324—321 **14 Claims**



1. Apparatus for rotating a test tube containing a sample at a predetermined rotational speed in a magnetic field in an NMR apparatus comprising:

a motor driving a hollow shaft in the NMR apparatus;

friction means for flexibly and substantially circumferentially coupling the test tube to the hollow shaft with sufficient friction to rotate the test tube with the hollow shaft while allowing the test tube to be removed from and inserted in the hollow shaft during rotation of the shaft; and

control means coupled to the motor for operating the motor at said predetermined rotational speed.

5,184,079

METHOD AND APPARATUS FOR CORRECTING DATA DEVELOPED FROM A WELL TOOL DISPOSED AT A DIP ANGLE IN A WELLBORE TO ELIMINATE THE EFFECTS OF THE DIP ANGLE ON THE DATA

Thomas D. Barber, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 13, 1990, Ser. No. 612,931

Int. Cl.[5] G01V *3/28, 3/18, 3/38*

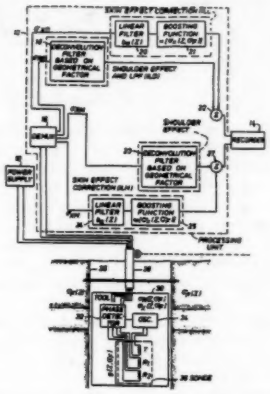
U.S. Cl. 324—339 **14 Claims**

4. An apparatus for correcting an induction log for dip effect and developing an output signal reflecting the correction, the induction log being an input signal representing a plurality of formation profile data developed by an induction tool when

said induction tool is disposed in a deviated borehole, said deviated borehole traversing a formation which includes a plurality of bedding planes, comprising:

means for determining an apparent dip angle representing an angle between a longitudinal axis of said deviated borehole and an axis perpendicular to said bedding planes;

means for converting said data developed by said induction tool when said tool is disposed in said deviated borehole to true bed thickness (TBT) format thereby producing TBT converted data;



means for processing and correcting the TBT converted data to reduce shoulder bed effects at approximately zero dip angle thereby producing processed, converted data;

means for determining two filters h(a1) and h(a2) as a function of two angles a1 and a2, where said two angles are related to said apparent dip angle as follows,

$$a1 < \text{said apparent dip angle} < a2,$$

said two filters h(a1) and h(a2) each being determined as a function of their angles a1 and a2 in accordance with the following expression,

$$\int_{-\infty}^{\infty} h(z - z')g(z')dz' = \delta(z - z')$$

where $\delta(z\text{-}z')$ is the Dirac delta function and g(z) is determined in accordance with the following expression,

$$g(z) = a\frac{d\sigma_m}{dz},$$

means for determining two values "sigma$_F$(a1) and sigma$_F$. (a2)" as a function of said two filters h(a1) and h(a2), respectively, and as a function of said processed, converted data in accordance with the following expression, where said two values are parameters representing said formation profile data at angles a1 and a2,

$$\sigma_F(j) = \sum_{n=-(N-1)/2}^{(N-1)/2} h_a(n)\,\sigma(j - n)$$

means for interpolating to determine a value "sigma$_F$" as a function of said apparent dip angle representing a parameter of said formation at said apparent dip angle using said two values, said two angles, and said apparent dip angle, said value "sigma$_F$" being said output signal.

5,184,080

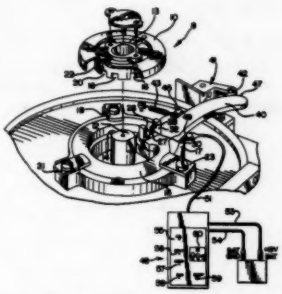
TEST APPARATUS FOR OPTO-ELECTRONIC TIME BASED GENERATOR OF AN IGNITION SYSTEM

Gregry M. Remmers, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 2, 1990, Ser. No. 608,541

Int. Cl.^{5} F02P *17/00*

U.S. Cl. 324—392 **2 Claims**



1. A test apparatus for an opto-electronic time base generator of an ignition system for an internal combustion engine, the time base generator having an encoder disk which rotates synchronously with the crankshaft of the engine and includes a predetermined number of timing sections of a predetermined width which are at fixed locations relative to the crankshaft, and at least one synchronizing section which is at a fixed location relative to the crankshaft and to at least one of said timing sections and the time base generator having a photo-electric detector for detecting the presence or absence of the timing sections and the at least one synchronizing section and for generating digital signals representative thereof, said test apparatus comprising:

means for powering said photo-electric detector;

means for counting the number of the representations of timing sections of the digital signals in one or more revolutions of the encoder;

means for generating an indication of whether the result of said counting means equals the predetermined number of said timing sections;

means for generating a visual indication of a correct count responsive to the coincidence of a correct count signal and an enabling indicator count signal; and

means for generating a visual indication of an incorrect count responsive to the coincidence of an incorrect count signal and said enabling indicator count signal.

5,184,081

FAULT LOCATION

Thomas Oswald, Dartford, and Ian J. Hirst, Orpington, both of United Kingdom, assignors to Northern Telecom Europe, London, England

Filed Mar. 19, 1991, Ser. No. 671,452

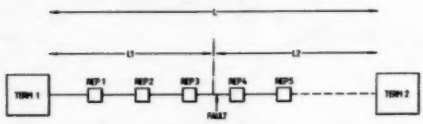
Claims priority, application United Kingdom, Mar. 22, 1990, 9006447

Int. Cl.^{5} G01R *31/11*

U.S. Cl. 324—533 **8 Claims**

1. A method of locating an intermittent electrical fault in the power feed circuit of an optical repeater simplex transmission system, the method comprising detecting the arrival of a first optical error signal at a terminal of the system, detecting the arrival of a second signal at a terminal of the system, said first signal having arisen at a repeater adjacent the fault as a result of said electrical fault and having travelled to said terminal via a first optical path, said second signal either being an electrical surge pulse which has travelled from the fault to a terminal via a power conductor of the system, or being a second optical

error signal which has arisen at a repeater adjacent the fault and travelled to a second terminal of the system via a second



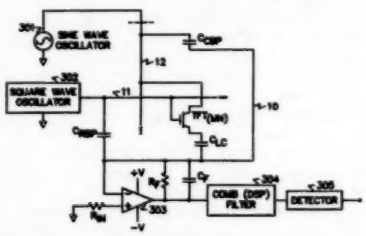
optical path, and determining the location of the fault by determining the time separation between the arrival of such first and second signals, and the rate of travel of the signals.

5,184,082

APPARATUS AND METHOD FOR TESTING AN ACTIVE MATRIX PIXEL DISPLAY

Larry A. Nelson, Albuquerque, N. Mex., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 18, 1991, Ser. No. 761,570
Int. Cl.[5] G01R *31/02, 27/02*
U.S. Cl. 324—537 **32 Claims**



1. A method of testing a condition of an active element pixel wherein the active element pixel has a column drive electrode, a row drive electrode, and a common electrode, and wherein the method of testing the condition of an active element pixel comprises the steps of:

a. driving the column drive electrode with a first periodic signal having a first frequency spectrum with first frequency components;

b. driving the row drive electrode with a second periodic signal having a second frequency spectrum with second frequency components wherein the combination of the first periodic signal and second periodic signal causes a third periodic signal in the common electrode wherein the third periodic signal has a modulated frequency spectrum with modulated frequency components and wherein the second frequency spectrum is selected to provide the modulated frequency spectrum with modulated frequency components positioned between the second frequency components;

c. filtering the first frequency spectrum from the modulated frequency spectrum to provide a filtered signal with a filtered signal magnitude; and

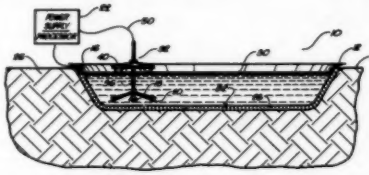
d. relating the filtered signal magnitude to the condition of the active element pixel.

5,184,083

APPARATUS AND METHOD FOR THE LOCATION OF LEAKS BY ARRAYED POTENTIALS AND DERIVED VECTORS

Thomas A. Groover, 1117 W. Drew, Houston, Tex. 77006

Filed Mar. 28, 1991, Ser. No. 676,282
Int. Cl.[5] G01N *27/00;* **G01R** *31/00;* **G01M** *3/16*
U.S. Cl. 324—559 **15 Claims**



1. An apparatus for the detection of leaks in an impoundment having at least one containment layer comprising:

a first electrode adapted to be positioned adjacent one side of the containment layer;

a probe assembly having an injection electrode connected thereto, said probe assembly having a plurality of sensor elements extending radially outwardly relative to said injection electrode, said sensor elements for sensing electrical potentials at points distal to said injection electrode, said injection electrode having a hemispherical configuration, said injection electrode adapted to be positioned such that a flat surface of said hemispherical configuration is adjacent another side of the containment layer;

a power source electrically connected to said first electrode and to said injection electrode, said power source for producing a current in said injection electrode, said current passing between said injection electrode and said first electrode through any leak in the containment layer; and

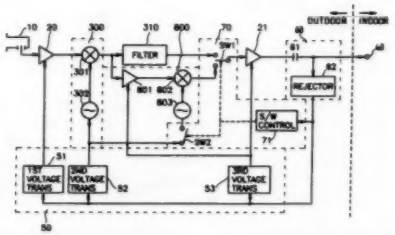
processor means interconnected to said sensor elements, said processor means for determining a direction of current flow from said injection electrode as sensed by said sensor elements.

5,184,084

DOUBLE BAND FREQUENCY CONVERTING SYSTEM

Ki-ho Yun, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi, Rep. of Korea

Filed Jul. 29, 1991, Ser. No. 736,923
Claims priority, application Rep. of Korea, Jul. 28, 1990, 90-11558
Int. Cl.[5] H04B *1/26, 15/00*
U.S. Cl. 328—15 **4 Claims**



1. A double band frequency converting system in a microwave radio receiver system having wave guide means for supplying a high frequency signal in a microwave frequency range at an output thereof, comprising:

first frequency converting means for changing the carrier frequency of said high frequency signal from a first value to a second lower value and outputting the changed high frequency signal at an output thereof;

second frequency converting means for changing the carrier frequency of the signal outputted by said first frequency converting means form said second lower value to a third value lower than said second lower value and outputting the resultant signal at an output thereof;

selection means for selecting one of the outputs of said first and second frequency converting means in response to a control signal; and

an intermediate frequency amplifier for amplifying the output selected by said selection means and transmitting the amplified output to a receiver.

5,184,085

HIGH-VOLTAGE PULSE GENERATING CIRCUIT, AND DISCHARGE-EXCITED LASER AND ACCELERATOR CONTAINING SUCH CIRCUIT

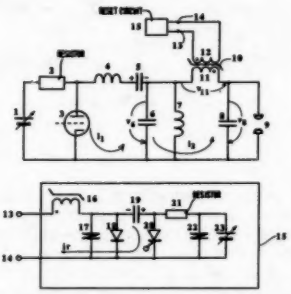
Shin Nakajima; Hiroyuki Aoyama; Rihito Kagawa, and Osamu Shimoe, all of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 537,073, Jun. 12, 1990, abandoned. This application Apr. 22, 1992, Ser. No. 873,632

Claims priority, application Japan, Jun. 29, 1989, 1-167365

Int. Cl.[5] H03K *3/45, 3/57*

U.S. Cl. 328—65 **17 Claims**



1. A high-voltage pulse generating circuit comprising a magnetic pulse compression circuit having a main saturable reactor provided with a reset circuit, said reset circuit including a second saturable reactor for providing said main saturable reactor with a pulse voltage or current for setting a magnetic flux density of said main saturable reactor at a gate initiation point to a predetermined constant level, wherein said second saturable reactor blocks a voltage surge of said main saturable reactor in an unsaturated region of said second saturable reactor, and wherein said second saturable reactor is saturated by the pulse current or voltage generated in the reset circuit for setting the magnetic flux density of said main saturable reactor.

5,184,086

DIFFERENTIAL AMPLIFIER

Haruyuki Inohana, and Shintaro Gomi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 12, 1991, Ser. No. 789,888

Claims priority, application Japan, Jun. 17, 1991, 3-144885

Int. Cl.[5] H03F *3/45*

U.S. Cl. 330—252 **2 Claims**

1. A differential amplifier comprising:

a resistance element;

first and second transistors, emitters of which are connected to each other through said resistance element;

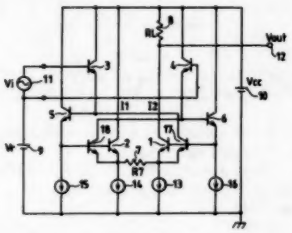
a third transistor, the emitter of which is connected to the collector of said first transistor;

a fourth transistor, the emitter of which is connected to the collector of said second transistor;

first level shift means for level-shifting a signal as much as a predetermined value which is provided at emitter of said third transistor, and applying said signal thus level-shifted to the base of said second transistor; and

second level shift means for level-shifting a signal as much as a predetermined value which is provided at the emitter of said fourth transistor, and applying said signal thus level-shifted to the base of said second transistor,

a fifth transistor, an emitter and a base of which are connected to the emitter and base of said second transistor so as to form a current mirror circuit; and



a sixth transistor, an emitter and a base of which are connected to the emitter and base of said first transistor so as to form a current mirror circuit;

wherein based of said third and fourth transistors are employed as input terminals, and wherein at least one of the collectors of said fifth and sixth transistors are employed as an output terminal.

5,184,087

TRANSCONDUCTANCE AMPLIFIER USING PARASITIC BIPOLAR TRANSISTORS TO EMBODY A CONSTANT VOLTAGE SOURCE

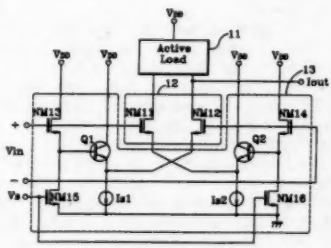
Cheong W. Kim, Kyungki-Do, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Filed Dec. 26, 1991, Ser. No. 813,626

Claims priority, application Rep. of Korea, Mar. 30, 1991, 4308/1991

Int. Cl.[5] H03F *3/45, 3/16*

U.S. Cl. 330—253 **5 Claims**



1. A transconductance amplifier, comprising:

an active load including current mirrors;

amplifying means provided with a pair of first and second NMOS transistors including gate terminals connected respectively to positive and negative input signal terminals and drain terminals connected to said active load, the drain terminal of said second NMOS transistor being connected to a current output terminal; and

bias means provided with a pair of third and fourth NMOS transistors including gate terminals connected respectively to the positive and negative input signal terminals and drain terminals connected to a voltage source terminal, a pair of fifth and sixth NMOS transistors including gate terminals connected commonly to a bias voltage

source terminal, source terminals connected to a ground terminal and drain terminals connected respectively to the source terminals of said third and fourth NMOS transistors, and a pair of first and second parasitic bipolar transistors including base terminals connected respectively to the source terminals of said third and fourth NMOS transistors, collector terminals connected to the voltage source terminal and emitter terminals connected respectively to source terminals of said second and first NMOS transistors in said amplifying means and to the ground terminal respectively through first and second current sources.

5,184,088

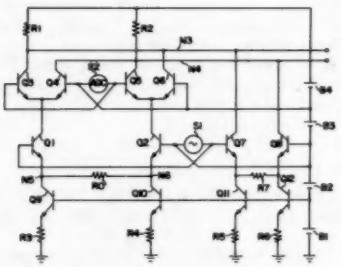
CONTROLLED-GAIN TRANSISTOR AMPLIFIER WITHOUT D-C SHIFT OR SIGNAL PHASE REVERSAL IN LOAD CURRENT

Jack Craft, Bridgewater, N.J., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jun. 10, 1992, Ser. No. 896,442

Int. Cl.[5] H03F 3/45

U.S. Cl. 330—254 **5 Claims**



1. A controlled-gain transistor amplifier with constant quiescent load current despite change in gain responsive to a control signal voltage, said controlled-gain transistor amplifier including:

first, second, third, fourth, fifth and sixth transistors, each having a base electrode, an emitter electrode and a collector electrode;

means for connecting said first and second transistors as a first emitter-coupled differential amplifier including

means for applying an input signal voltage between the base electrodes of said first and second transistors;

means for connecting said third and fourth transistors as a first current splitter, including

an interconnection between the emitter electrodes of said third and fourth transistors to which the collector electrode of said first transistor connects, and including

means for applying said control signal voltage between the base electrodes of said third and fourth transistors;

means for connecting said fifth and sixth transistors as a second current splitter, including

an interconnection between the emitter electrodes of said fifth and sixth transistors to which the collector electrode of said second transistor connects, and including

means for applying said control signal voltage between the base electrodes of said fifth and sixth transistors;

means for applying an operating potential to a first interconnection, which is between the collector electrodes of said third and sixth transistors, and

means for applying an operating potential to a second interconnection, which is between the collector electrodes of said fourth and fifth transistors, at least one of which means for applying an operating potential includes

an output load; and

the improvement comprising:

seventh and eighth transistors, each having a base electrode, and emitter electrode and a collector electrode; and

means for connecting said seventh and eighth transistors as a second emitter-coupled differential amplifier, including

means for applying said input signal voltage between the base electrodes of said seventh and eighth transistors, and including

means for connecting the collector electrodes of said seventh and eighth transistors to separate ones of said first and second connections.

5,184,089

DIFFERENTIAL AMPLIFIER HAVING OUTPUT CURRENT LIMITING

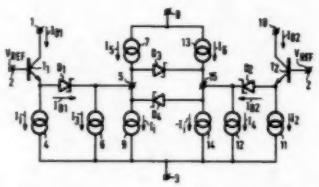
Jan Van Gorsel, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1992, Ser. No. 869,277

Claims priority, application European Pat. Off., Apr. 26, 1991, 91201004.8

Int. Cl.[5] H03F 3/45

U.S. Cl. 330—254 **6 Claims**



1. A differential amplifier having output current limiting, comprising:

first and second transistors each having a control electrode and a first and a second main electrode;

first and second output terminals coupled to the first main electrodes of the respective first and second transistors;

a first current terminal and a second current terminal;

at least a first diode having an anode coupled to the second main electrode of the first transistor and a cathode coupled to the first current terminal;

at least a second diode having an anode coupled to the second main electrode of the second transistor and a cathode coupled to the second current terminal;

a first current source coupled to the second main electrode of the first transistor for applying a first current (I_1) to the first transistor;

a second current source coupled to the second main electrode of the second transistor for applying a second current (I_2) to the second transistor;

a third current source coupled to the first current terminal for applying a third current (I_3) to the first current terminal;

a fourth current source coupled to the second current terminal for applying a fourth current (I_4) to the second current terminal,

means for applying reference voltages to the control electrodes of the first and second transistors;

a fifth current source coupled to the first current terminal for applying to the first current terminal a fifth current (I_5) which is smaller than the third current (I_3) and is opposite to the third current;

a sixth current source coupled to the second current terminal for applying to the second current terminal a sixth current (I_6) which is smaller than the fourth current (I_4) and is opposite to the fourth current;

at least a third diode whose anode is coupled to the first current terminal and whose cathode is coupled to the second current terminal;

at least a fourth diode whose cathode is coupled to the first

current terminal and whose anode is coupled to the second current terminal;

a first signal current source coupled to the first current terminal for applying a first signal current ($+I_i$) to the first current terminal; and

a second signal current source coupled to the second current terminal for applying to the second current terminal a second signal current ($-I_i$) which is opposite to the first signal current ($+I_i$).

5,184,090

HEAD AMPLIFIER

Fukuji Anzai, Moriguchi, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

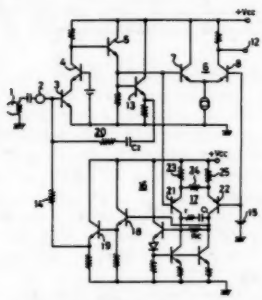
PCT No. PCT/JP91/00091, § 371 Date Sep. 3, 1991, § 102(e) Date Sep. 3, 1991, PCT Pub. No. WO91/11803, PCT Pub. Date Aug. 8, 1991

PCT Filed Jan. 28, 1990, Ser. No. 752,679

Claims priority, application Japan, Jan. 29, 1990, 2-18634

Int. Cl.[5] H03F *1/34*

U.S. Cl. 330—294 **7 Claims**



1. A head amplifier comprising:

an amplifier effective for producing an output in response to a playback signal from a head;

a differential amplifier;

means for feeding said output to said differential amplifier;

means for producing a reference voltage;

means for connecting said reference voltage to said differential amplifier;

means for comparing said output with said reference voltage; and

means for feeding back an output of said means for comparing to an input of said amplifier.

5,184,091

CIRCUIT FOR PHASE LOCKING AN OSCILLATOR WITHIN ANY ONE OF A PLURALITY OF FREQUENCY RANGES

Gopal K. Srivastava, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 4, 1991, Ser. No. 709,939

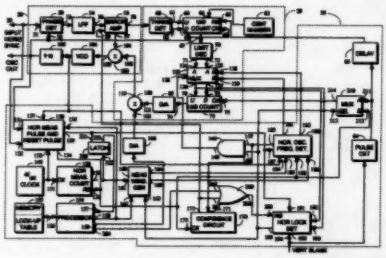
Int. Cl.[5] H03L *7/06;* **H04N** *5/05*

U.S. Cl. 331—10 **28 Claims**

27. A method for controlling a horizontal oscillator forming part of a phase locked loop in response to a received horizontal sync signal, said method comprising:

operating said oscillator in response to a control signal within a spectrum of frequencies divided into a plurality of frequency ranges including the frequency of the received sync signal for generating an oscillator signal representing the received signal to a first approximation by placing the frequency of said oscillator within the same frequency range as said sync signal; and

modifying said control signal is response to a frequency comparison of said oscillator and sync signals for adjusting the frequency of said oscillator signal for representing the frequency of the received sync signal to a second more precise approximation and establishing confidence in the



accuracy of said second approximation and enabling said phase locked loop in response to establish confidence.

5,184,092

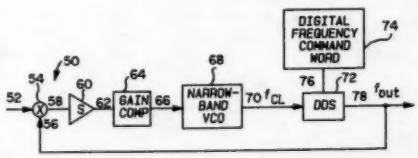
PHASE-LOCKED LOOP FREQUENCY TRACKING DEVICE INCLUDING A DIRECT DIGITAL SYNTHESIZER

Iradj Shahriary, Santa Monica, and Kevin M. McNab, Hawthorne, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 633,864, Dec. 26, 1990, Pat. No. 5,130,671. This application Jun. 16, 1992, Ser. No. 899,391

Int. Cl.[5] H03L *7/08, 7/099, 7/16*

U.S. Cl. 331—16 **20 Claims**



1. A phase-locked loop comprising:

a phase detector for comparing the phase of an input signal having a time varying frequency with a return signal and for producing a DC magnitude signal proportional to the comparison;

a voltage controlled oscillator in communication with the phase detector for producing an AC signal representative of the DC magnitude signal from the phase detector; and

a signal generator for receiving the AC representative signal as a clocking frequency and producing the phase-locked loop output signal representative of the input signal, said output signal also acting as the return signal to the phase detector.

5,184,093

FREQUENCY SYNTHESIZER

Kenji Itoh; Akio Iida, and Shuji Urasaki, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 25, 1992, Ser. No. 840,937

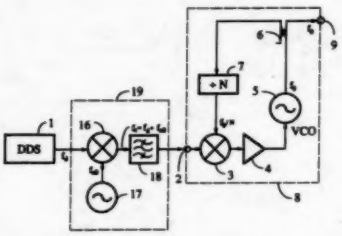
Claims priority, application Japan, Mar. 8, 1991, 3-043515; Nov. 26, 1991, 3-310339

Int. Cl.[5] H03L *7/00*

U.S. Cl. 331—25 **17 Claims**

1. A frequency synthesizer, including a direct digital synthesizer (DDS) for providing wave amplitude data as a standard signal source, and a phase lock loop for comparing a branched

synthesizer frequency with the standard signal source at a phase comparator, comprising:



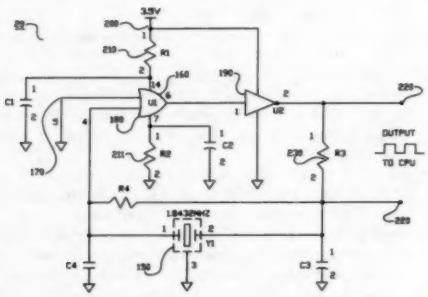
a frequency converter for converting the output frequency of the DDS to a higher frequency and for providing the resultant higher frequency to the phase comparator in the phase lock loop.

5,184,094

LOW POWER OSCILLATOR CIRCUITS

Raymond H. Kohler, Souderton, Pa., assignor to Moore Products Co., Spring House, Pa.

Filed Aug. 16, 1991, Ser. No. 746,353
Int. Cl.[5] H03B *5/06, 5/36*
U.S. Cl. 331—158 **22 Claims**



1. A clock circuit comprising:

resonator means for providing an input waveform of a specified frequency to the clock circuit;

generator means biased at a first voltage having at least two input terminals wherein one of the two input terminals is coupled to the resonator means for producing a substantially square wave output having a square frequency corresponding substantially to the input waveform frequency; and

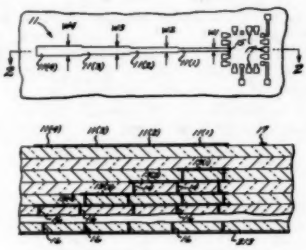
power output means coupled to the generator means for outputting a substantially square wave having substantially the same frequency as the input waveform, the power output means being biased at a higher voltage level than the generator means, such that the power output means is biased at the ned of its biased range.

5,184,095

CONSTANT IMPEDANCE TRANSITION BETWEEN TRANSMISSION STRUCTURES OF DIFFERENT DIMENSIONS

Curtis L. Hanz, Redondo Beach; Jon J. Gulick, Hawthorne; Kathleen L. Virga, Redondo Beach, and Allen Podell, Palo Alto, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 31, 1991, Ser. No. 739,009
Int. Cl.[5] H01P *5/00*
U.S. Cl. 333—33 **7 Claims**



1. A microstrip transmission line structure formed in a unitized multilayer circuit structure having a plurality of insulating layers, the microstrip transmission line structure comprising:

a series of connected microstrip strip sections having different widths disposed on an outside layer of the unitized multilayer circuit structure and forming a microstrip line;

respective ground planes for each of said strip sections formed between insulating layers and respectively spaced from the associated strip sections to provide a substantially constant impedance along the length of the microstrip line; and

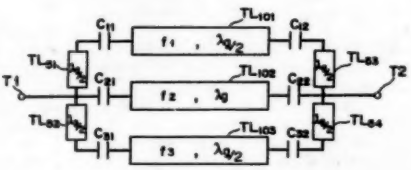
a plurality of conductive vias for electrically interconnecting said respective ground planes.

5,184,096

PARALLEL CONNECTION MULTI-STAGE BAND-PASS FILTER COMPRISING RESONATORS WITH IMPEDANCE MATCHING MEANS CAPACITIVELY COUPLED TO INPUT AND OUTPUT TERMINALS

Kikuo Wakino; Toshio Hishikawa; Youhei Ishikawa; Koichi Takehara, and Toru Tanizaki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 517,248, May 1, 1990, Pat. No. 5,097,236.
This application Aug. 27, 1991, Ser. No. 750,614
Claims priority, application Japan, May 2, 1989, 1-113927; Apr. 19, 1990, 2-103961
The portion of the term of this patent subsequent to Mar. 17, 2009, has been disclaimed.
Int. Cl.[5] H03H *7/00;* **H01P** *1/201*
U.S. Cl. 333—175 **9 Claims**



1. A parallel connection multi-stage band-pass filter comprising an input terminal and an output terminal for signals, and a plurality of resonators each provided with first and second ports;

said resonators having respective resonant frequencies different from and close to each other;

said first port of each of said resonators being electrically connected to said input terminal through first impedance matching means;

said second port of each of said resonators being electrically connected to said output terminal through second impedance matching means;

wherein said first port of each of said resonators is electrically connected to said input terminal through said first impedance matching means by capacitive coupling;

said second port of each of said resonators being electrically connected to said output terminal through said second impedance matching means by capacitive coupling.

5,184,097

AGILE MICROWAVE FILTER HAVING AT LEAST ONE FERRITE RESONATOR

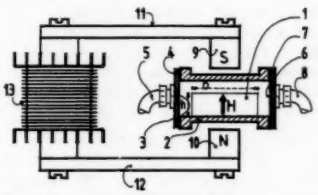
Carole Brouzes, Asnieres; Claude Ressencourt, Acquigny, and Alain de Place, Paris, all of France, assignors to Alcatel Transmission par Faisceaux Hertziens, Levallois Perret Cedex, France

Filed Feb. 15, 1991, Ser. No. 655,604

Claims priority, application France, Feb. 23, 1990, 90 02280

Int. Cl.[5] H01P *1/219*

U.S. Cl. 333—202 **2 Claims**



1. An agile microwave filter comprising: a waveguide, at least one dielectric confinement resonator operating in TM mode, made of ferrite material and placed on the bottom of said waveguide, said waveguide operating in evanescent mode, and means for applying a magnetic field of adjustable intensity to said at least one ferrite resonator for shifting the center frequency of the filter.

5,184,098

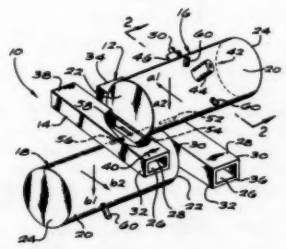
SWITCHABLE DUAL MODE DIRECTIONAL FILTER SYSTEM

Rolf Kich, Redondo Beach, and Paul J. Tatomir, Laguna Niguel, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 10, 1992, Ser. No. 832,877

Int. Cl.[5] H01P *1/208*

U.S. Cl. 333—208 **10 Claims**



1. A switchable mode directional filter system comprising: a first filter and a second filer;

an input waveguide defining a first input port and a second input port;

an output waveguide defining a first output port and a second output port;

input coupling means for coupling an input electromagnetic signal from said input waveguide into each of said filters;

output coupling means for coupling signals outputted by said filters into said output waveguide; and

means operatively associated with at least one of said filters for switching the output signal between said first and second output ports.

5,184,099

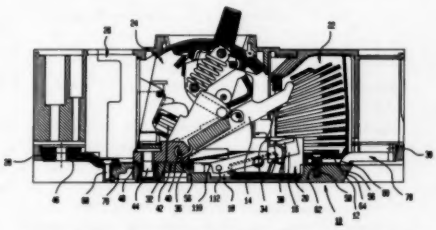
CIRCUIT BREAKER WITH DUAL MOVABLE CONTACTS

Bernard DiMarco, Lilburn; Robert E. Black, Snellville, and Stephen D. Cella, Stone Mountain, all of Ga., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Jun. 13, 1991, Ser. No. 714,803

Int. Cl.[5] H01N *75/00*

U.S. Cl. 335—16 **12 Claims**



1. In a circuit breaker of the type including a first circuit breaker contact arm mechanically coupled to an operating mechanism, a circuit breaker contact arm support comprising:

a support;

a second circuit breaker contact arm supported by the support to pivot between a first position and a second position, the second circuit breaker contact arm being engageable with the first circuit breaker contact arm substantially at the first position; and

an arrangement disposed to apply a first force to the second circuit breaker contact arm while the second circuit breaker contact arm is in the first position and a second force to the second circuit breaker contact arm when the second circuit breaker contact arm is in the second position;

where the first and second forces urge the second circuit breaker contact arm toward the first position and the first force is greater than the second force.

5,184,100

CIRCUIT BREAKER

Jun Oyama, and Naoshi Uchida, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1991, Ser. No. 691,425

Claims priority, application Japan, Apr. 26, 1990, 2-111159; Jul. 19, 1990, 2-191682; Nov. 22, 1990, 2-318868

Int. Cl.[5] H01H *75/00*

U.S. Cl. 335—16 **7 Claims**

1. A circuit breaker, comprising:

a housing;

a terminal disposed in said housing;

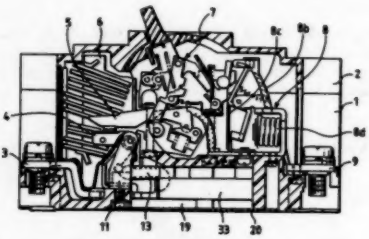
a first movable arm disposed in said housing, including a first contact;

a support member disposed in said housing;

a second movable arm pivotally supported by said support member and being electrically connected to said terminal by a flexible lead, said second movable arm including a second contact and being disposed opposite said first

movable arm so that said second contact contacts said first contact when a normal current flows, wherein said first movable arm exerts an electromagnetic repulsive force on said second arm in a direction where the first and second movable arm repel each other to open said first and second contacts in response to a current exceeding a predetermined value;

an insulating member fitted with said support member and said terminal to form a unitary construction, said insulating member insulating said support member from said terminal;



a rear cover disposed on said housing;

a plate-like packing disposed between said housing and said rear cover; and

a chamber disposed in said housing, said chamber including an opening, said plate-like packing including a plurality of windows in alignment with said opening, wherein said rear cover is held tightly against said housing so that said chamber is hermetically isolated by said plate-like packing disposed between said rear cover and said housing.

5,184,101

UNDERVOLTAGE TRIPPING DEVICE

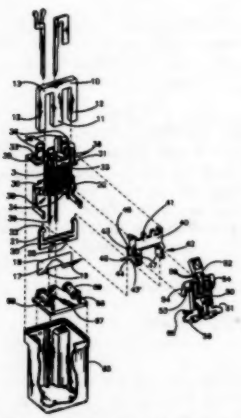
Kurt Ineichen, Emmenbrücke; Peter Rüedi, Neuenkirch, and Herbert Wirth, Gisikon, all of Switzerland, assignors to Weber AG, Emmenbrucke, Switzerland

Filed May 23, 1991, Ser. No. 704,336

Claims priority, application Switzerland, May 23, 1990, 1774/90

Int. Cl.[5] H01H *51/22*

U.S. Cl. 335—78 **12 Claims**



1. An undervoltage tripping device for actuating an appliance protective switch when the line voltage of an AC power line drops below a nominal value, the tripping device comprising:

a rectifier (67) connected to the AC power line for converting AC current to DC current;

a DC electromagnet including a magnetic winding (3) energizeable by DC current from the rectifier and a core (10) which is at least partially surrounded by the magnetic winding;

an armature (20) magnetically coupled with the core and movable between an attracted position and a dropped position, the armature being in the attracted position when the line voltage of the power line is at the nominal value, the armature being spring-loaded to move from the attracted position to the dropped position when the line voltage of the power line drops below the nominal value; and

a tripping member (50) connectable to the appliance protective switch and movable between a latched position and a released position for, when connected to the appliance protective switch and in the released position, actuating the appliance protective switch, the tripping member being mechanically coupled with the armature and movable relative to the armature, the armature acting as a ratchet for the tripping member to maintain the tripping member in the latched position when the line voltage of the power line is at the nominal value, the tripping member being spring-loaded from the latched position to the released position to thereby actuate the appliance protective switch when the line voltage of the power line drops below the nominal value, the tripping member moving the armature from the dropped position back to the attracted position when the tripping member is moved from the released position back to the latched position.

5,184,102

HOUSING FOR AN ELECTROMECHANICAL COMPONENT, PARTICULARLY FOR A RELAY

Erwin Müller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

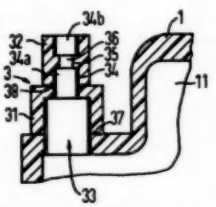
PCT No. PCT/DE89/00268, § 371 Date Jul. 17, 1991, § 102(e) Date Jul. 17, 1991, PCT Pub. No. WO90/08393, PCT Pub. Date Jul. 26, 1990

PCT Filed Apr. 27, 1989, Ser. No. 730,929

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1989, 8900466

Int. Cl.[5] H01H *9/02*

U.S. Cl. 335—202 **12 Claims**



1. A housing for an electromechanical component, comprising:

a housing wall that tightly terminates a gas-filled interior, said housing wall including a severable projection extending outwardly of said housing wall into which a channel extends proceeding from the interior of said housing wall, said channel in the projection has at least two sections having different cross sections that become smaller from inside toward outside of said housing wall in steps; and a cross-wall in an outer section of said two sections of the channel, said outer section being of a smaller cross section than an inner section of said two sections.

5,184,103

HIGH COUPLING TRANSFORMER ADAPTED TO A CHOPPING SUPPLY CIRCUIT

Jean Gadreau, Echirolles, and Andre Pascal, St. Joseph de Riviere, both of France, assignors to Bull, S.A., Paris, France

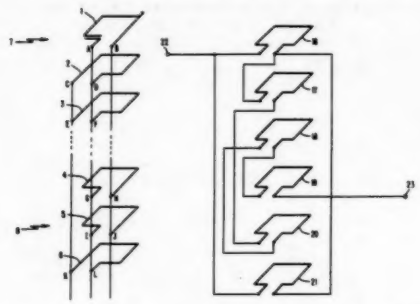
PCT No. PCT/FR88/00229, § 371 Date Jan. 17, 1989, § 102(e) Date Jan. 17, 1989, PCT Pub. No. WO88/09042, PCT Pub. Date Nov. 17, 1988

Continuation of Ser. No. 314,065, Jan. 17, 1989, abandoned. This PCT application May 10, 1988, Ser. No. 649,181

Claims priority, application France, May 15, 1987, 87 06835

Int. Cl.[5] H01F *15/04, 27/30*

U.S. Cl. 336—84 C **40 Claims**



1. A transformer adapted to be connected in a chopper power supply driven by a DC source having a terminal, the supply including a switching transistor having an electrode, the transformer comprising a primary winding and a secondary winding having first and second parts on opposite sides of the primary winding, each part of said secondary winding having turns connected in series and parallel, each of said windings including plural turns, individual ones of said turns being formed by a printed circuit electrically conducting layer, said layers being (i) magnetically coupled to each other, (ii) stacked in mutually parallel planes, and (iii) connected to each other so that:

(a) terminals of first and second of said layers respectively forming closest adjacent turns in the stack of the primary and secondary windings have approximately fixed potentials while the primary winding is connected to the terminal of the DC source and (b) third and fourth of said layers respectively forming most remote turns in the stack of primary and secondary windings have potentials that vary relative to the fixed potential to a greater extent than any other turns in the stack while the primary winding is connected to the terminal of the DC source and the electrode of the switching transistor.

5,184,104

ELECTROMAGNETIC INDUCTION APPARATUS WITH A SOUND SUPPRESSING ARRANGEMENT

Katsumi Kondo, Ako, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 302,416, Jan. 27, 1989, abandoned. This application Jun. 13, 1990, Ser. No. 538,093

Claims priority, application Japan, Feb. 29, 1988, 63-48231

Int. Cl.[5] H01F *15/00*

U.S. Cl. 336—100 **3 Claims**

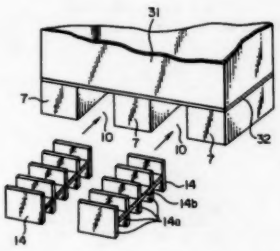
1. An electromagnetic induction apparatus comprising:

a support surface;

a tank having a bottom surface and containing an electrical device;

a plurality of support members attached to the bottom surface of the tank and supporting the weight of the tank on the support surface, the support members defining a chamber between the bottom surface of the tank and the support surface;

a sound suppressing plate having top and bottom surfaces and disposed in the chamber between the support surface and the bottom surface of the tank substantially parallel to



and spaced from both the bottom surface of the tank and the support surface; and

a plurality of support plates extending from the top and bottom surfaces of the sound suppressing plate and supporting the sound suppressing plate above the support surface.

5,184,105

BOBBIN FOR MULTIPLE-CONNECTED INDUCTOR

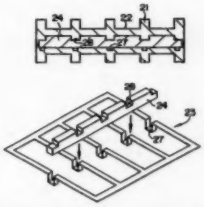
Kunihisa Endo, Tsurugashima, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1991, Ser. No. 661,371

Claims priority, application Japan, May 11, 1990, 2-49209[U]

Int. Cl.[5] H01F *15/10, 27/30*

U.S. Cl. 336—192 **7 Claims**



1. A bobbin for a multiple-connected inductor comprising:

(a) an elongated member formed of synthetic resin and including at least three flanges and winding grooves for coils partitioned by said flanges;

a metal piece partially embedded in said member and projecting outside said member at a portion of each of said flanges to serve as an electrode or a connecting portion of the coils; and

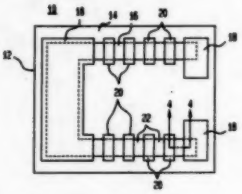
a rod-shaped magnetic body disposed entirely within said member and extending over a plurality of said winding grooves under a state in which said magnetic body is supported by portions of said metal pieces which are entirely embedded within said member formed of synthetic resin.

5,184,106

MAGNETIC FIELD SENSOR WITH IMPROVED ELECTRON MOBILITY

Dale L. Partin, Romeo, and Joseph P. Heremans, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1991, Ser. No. 646,893
Int. Cl.[5] H01L *43/00*
U.S. Cl. 338—32 R **45 Claims**



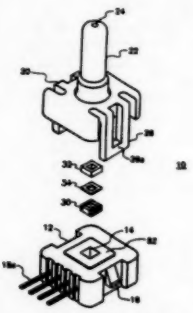
1. A magnetic field sensor comprising:
a substrate having a surface; and
an active film of a high electron mobility semiconductor material on said substrate surface, said active film comprising a first layer of the said semiconductor material which is undoped or lightly doped, and a second layer of said semiconductor material at least a portion of which is of highly doped n-type conductivity.

5,184,107

PIEZORESISTIVE PRESSURE TRANSDUCER WITH A CONDUCTIVE ELASTOMERIC SEAL

Dean J. Maurer, Freeport, Ill., assignor to Honeywell, Inc., Minneapolis, Minn.

Continuation of Ser. No. 646,568, Jan. 28, 1991, abandoned. This application Jan. 24, 1992, Ser. No. 826,206
Int. Cl.[5] H01C *10/10*
U.S. Cl. 338—42 **25 Claims**



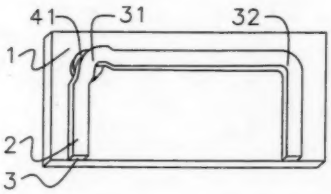
1. A pressure transducer assembly comprising:
a diaphragm of semiconductor material having a central portion with a stress sensitive device formed thereon electrically conductive regions extending from the stress sensitive device to a peripheral portion of said diaphragm;
a housing containing said diaphragm and having at least one pressure port which communicates with said diaphragm, and said housing and having first and second opposing internal surfaces configured to form first and second seats for seals on opposite sides of the diaphragm;
electrical leads which extend from one of the interior to the exterior of the housing are positioned proximate to the first seats; and
first and second elastomeric seals located between said diaphragm and the first and second seats respectively, each of said elastomeric seals being molded in a configuration to extend from the seat on a separate one of the internal surfaces of said housing to a surface of said diaphragm at a location surrounding the central portion thereof, said housing being adapted to hold said first and second seals and said diaphragm between the first and second seats so as to form a pressure tight seal between said housing and said diaphragm on opposite sides thereof, said first elastomeric seal being electrically conductive so as to conduct current from the electrically conductive regions on said diaphragm to the electrical leads.

5,184,108

CONDUCTIVE CORNERS FOR SURGE SURVIVAL

Terry Bloom, Middlebury, and Craig Ernsberger, Granger, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Jan. 2, 1991, Ser. No. 638,443
Int. Cl.[5] H01C *10/10*
U.S. Cl. 338—195 **15 Claims**



1. A composite electrical component having a finite resistance to current flow comprising a first conductive material having two terminations, said first conductive material being electrically continuous between said two terminations, said first conductive material having first relatively localized regions therein prone to failure or causing second relatively localized regions of said composite electrical component to fail during the application of large surges of electrical energy between said two terminations, the improvement comprising second conductive material located adjacent to said first and said second relatively localized regions and electrically connected to said first conductive material to shunt current from said first conductive material through said second conductive material while not disrupting the electrical continuity of said first conductive material between said two terminations, said second conductive composition limited in size and placement substantially to said first and said second relatively localized regions.

5,184,109

OVERCHARGE PREVENTIVE DEVICE FOR AUTOMOTIVE BATTERIES

Hirokazu Tanaka, and Koichi Ito, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

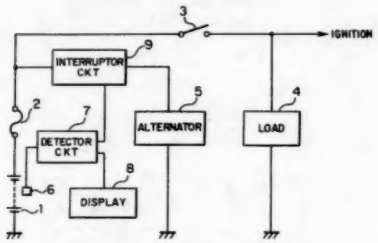
Filed Jan. 15, 1991, Ser. No. 641,413
Claims priority, application Japan, Jan. 17, 1990, 2-3451[U]; Jan. 20, 1990, 2-3985[U]
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 340—455 **7 Claims**

1. An overcharge preventive device for a battery charging circuit of an automobile which includes a battery and a charging generator circuit coupled across the battery, said overcharge preventive device comprising:
odorant sensor means for detecting an amount of gas developed from said battery when the battery is being charged by said charging generator circuit;
overcharge detector means, connected to an output of said odorant sensor means and disposed near said battery, for identifying when said generator circuit malfunctions and causes an excessively high charging rate to be supplied to the battery based on a level of said output of said odorant

sensor means, said overcharge detector means detecting an overcharged state of the battery when the output of said odorant sensor means indicates that an amount of gas detected by said odorant sensor means has exceeded a predetermined level, the overcharge detector means outputting an output signal only when a generator circuit malfunction is identified;

interrupter means, connected to the overcharge detector means and connected between the battery and said charging generator circuit, for automatically electrically separating said charging generator circuit from said battery in response to said output of said overcharge detector means which is generated only when said generator circuit malfunction is identified; and

alerting means, connected to said overcharge detector means, for alerting a driver of said automobile that said generator circuit malfunction has occurred in response to the output of said overcharge detector means.



5,184,110

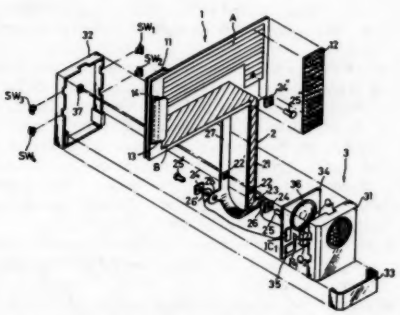
HANDLE-ATTACHABLE SUITCASE ALARM

Ming-Gin Horng, 6F-1, No. 86, Keh Nan St., Taipei, Taiwan

Filed Oct. 7, 1991, Ser. No. 772,542

Int. Cl.[5] G08B *13/14*; H01H *9/06*

U.S. Cl. 340—571 **4 Claims**



1. An alarm for attachment to the handle of a suitcase comprising:

a) a soft cover of steady insulation impedance for attachment to a handle of suitcase, the cover including plural contact faces and means for detachably securing the cover around the handle;

b) a conduction strip including two conduction sections, two ends attached to the cover, plural connection ears, each connection ear provided with a first through hole formed therein, and plural second through holes formed in the conduction strip;

c) a housing including a top cover, a loudspeaker screen, a battery cover, a seat having a square cotter, a plurality of switch openings and a base board mounted on the seat;

d) an alarm means including an alarm circuit having an alarm IC, two transistors, a resistor, a power switch, a battery and a loudspeaker; and

e) conductor terminals for connecting the alarm circuit to the connection ears, wherein bridging of the contact faces by an unauthorized human hand gripping the handle of a suitcase to which the cover is attached completes the circuit and triggers the alarm means.

5,184,111

CIRCUIT ARRANGEMENT ON A SUPPORT FILM

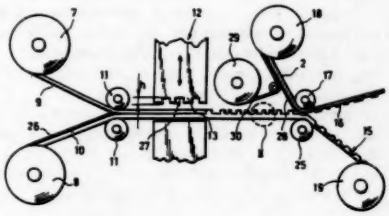
Fritz Pichl, Seehalden Strasse 17, CH-8802 Kilchberg, Switzerland

Filed Oct. 18, 1990, Ser. No. 599,701

Claims priority, application Switzerland, Oct. 20, 1989, 3818/89

Int. Cl.[5] G08B *13/24*

U.S. Cl. 340—572 **10 Claims**



1. A circuit arrangement comprising at least one cut electrically conductive track arranged on at least one surface of a support film by means of an adhesive layer, wherein the surface of the adhesive layer is free of other materials next to the conductive track, the support film being essentially free of deformations and fluctuations in thickness (t), both in the region of the conductive track arranged on it and outside this region; and wherein the conductive track has a stamping burr projecting away from the support film at the edges formed between the surface and the cut sides of the conductive track.

5,184,112

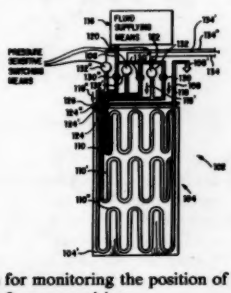
BED PATIENT POSITION MONITOR

Ignaty Gusakov, East Aurora, N.Y., assignor to Gaymar Industries, Inc., Orchard Park, N.Y.

Filed Sep. 11, 1991, Ser. No. 757,621

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—573 **24 Claims**



1. Apparatus for monitoring the position of a body relative to a support surface, comprising:

means for sensing movement of a body from a first position to a second position relative to a support surface, said sensing means including at least a first sensor and a second sensor;

means for providing an alarm signal including at least a first

alarm member, a second alarm member and a third alarm member; and

means for electrically connecting said sensing means to said alarm signal means for selectively activating saidarm signal means in response to said movement, said connecting means comprising:

at least a first filter means having an input electrically connected to said first sensor, and an output, and a second filter means having an input electrically connected to said second sensor, and an output;

at least a first inverter means having an input electrically connected to said output of said first filter means, and an output, and a second inverter means having an input electrically connected to said output of said second filter means, and an output;

first means, having inputs electrically connected to the outputs of said first and second inverter means and an output electrically connected to said first alarm member for sending a first alarm signal to said first alarm member;

second means having inputs electrically connected to at least the outputs of said first and second filter means, and an output electrically connected to said second alarm member, for sending a second alarm signal to said second alarm member; and

third means having inputs electrically connected to the outputs of said first and second filter means and said first and second inverter means, and an output electrically connected to said third alarm member for sending a third alarm signal to said third alarm member.

5,184,113

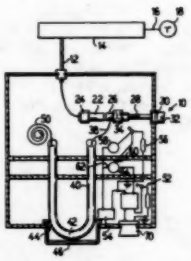
ELECTRICAL FIELD DISPLAY/SIGNAL DEVICE

Greg Baron, 5434 W. 31st St., Cicero, Ill. 60650

Continuation of Ser. No. 590,944, Oct. 1, 1990, abandoned. This application Oct. 29, 1991, Ser. No. 784,128

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—635 **13 Claims**



1. A display device for use with an electrical field generator comprising:

a housing for said device;

an electrical conductor extending from a point on said electrical field generator distant from a power supply to a first terminal fixedly secured within said housing;

a second terminal spaced from said first terminal;

means for adjusting the size of a space between said two terminals; and

a display means connected at a first end to said second terminal for indicating the presence or absence of an electrical potential at said point on said electrical field generator and connected at an opposite end to an isolator coil;

said display means being perceptible from an exterior of said housing.

5,184,114

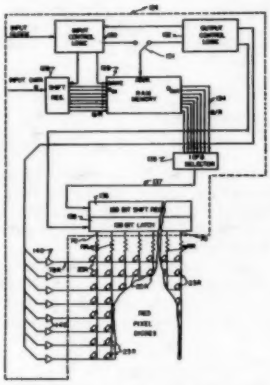
SOLID STATE COLOR DISPLAY SYSTEM AND LIGHT EMITTING DIODE PIXELS THEREFOR

Brent W. Brown, Smithfield, Utah, assignor to Integrated Systems Engineering, Inc., Logan, Utah

Continuation of Ser. No. 339,778, Apr. 18, 1989, abandoned, which is a continuation of Ser. No. 155,790, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 738,624, May 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 439,149, Nov. 4, 1982, abandoned. This application Mar. 15, 1990, Ser. No. 495,006

Int. Cl.[5] G09G *3/32*

U.S. Cl. 340—701 **38 Claims**



1. A large matrix display system comprising:

an array comprising a large number of juxtaposed multicolor solid state integrated pixels and means arranging the pixels in a close matrix pattern;

each pixel comprising an exposed face comprising a plurality of differently colored separate LEDs and means compactly arranging the LEDs so that each pixel is an apparent point composite color light source to an observer of the array;

a plurality of separate conductor means forming a part of each pixel, one separate conductor means for the LEDs of each color, means by which each conductor means electrically communicates only with all of the LEDs of one color of the pixel whereby a coordinated series of different signals is respectively communicated to the LEDs of each color to sequentially visually create at each pixel A succession of composite colors one after another ranging across a large number of color combinations;

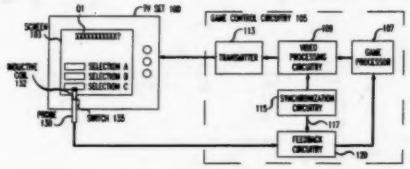
means comprising a source of separate but coordinated series of signals for the LEDs of the same color for each pixel of the matrix display;

means controlling and delivering said coordinated series of signals separately but simultaneously respectively to the LEDs of same color of each pixel of the matrix display in such ar168ner that each pixel will, at any point in time, display only one composite color from within said large number of color combinations comprising a visual integration of the period of illumination of each LED of each pixel produced by each of the plurality of coordinated signals delivered to the differently colored LEDs of each pixel and said one composite color of each pixel will sequentally change from time to time as said plurality of coordinated signals from said source means and controlling and delivering means change whereby images of composite colors, which vary with time across the spectrum of a large number of color combinations, are successively visually illuminated on the matrix display.

5,184,115
TOUCH-SCREEN ARRANGEMENT

Edward P. Black, Salt Lake City, Utah, and Douglas C. Smith, Rumson, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 4, 1990, Ser. No. 532,721
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—708 **30 Claims**



1. Apparatus for use with a CRT, said CRT emitting an electron beam which scans a viewing screen, said apparatus comprising

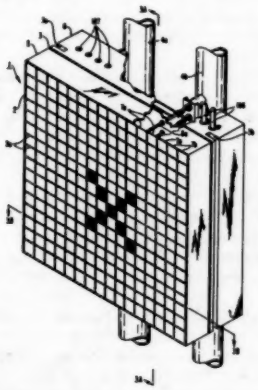
means including an inductive coil for detecting a magnetic field generated by the scan of said electron beam on said viewing screen, and

means for activating a generation of a signal indicative of a detection of said magnetic field.

5,184,116
BACK-LIGHTABLE DIFFUSIVE DISPLAY SIGN

Ronald R. Daugherty, Washington, and Richard J. Petrocy, Carteret, both of N.J., assignors to Mediatronics, Inc., Carteret, N.J.

Filed Oct. 1, 1990, Ser. No. 590,914
Int. Cl.[5] G09G *3/16*
U.S. Cl. 340—764 **16 Claims**



1. A back-lightable sign which comprises in combination;

a source of light,

a display panel in the path of light from said source, said display panel for displaying alphanumeric characters and graphics comprising a plurality of mechanically movable display elements which move interchangeably from a first position in which a dark face is visible to a second position in which a bright face is visible;

means for manipulating said mechanically movable display elements from said first position to said second position and vice versa;

and diffusion means interposed between said source of light and said display panel for scattering the light falling on said display panel from said source whereby shadows cast by said means for manipulating said mechanically moving display elements are substantially invisible from the front of said display panel;

in which said diffusion means comprises a plate of solid translucent material interposed between said source of light and said display panel, said plate constructed and arranged to diffuse light passing through said plate;

wherein said mechanically-moveable elements are arranged in rows and columns corresponding to the width and length of said display panel, wherein each of said mechanically movable elements comprises a first rectangular plate having a dark surface, and a substantially identical second rectangular plate having a bright surface, said first plate and said second plate being fastened together along one of each of their edges to form a triangular configuration in which the dark plate faces outward on one side and the bright plate faces outward on the other side,

a yoke connected between the undersides of said plates in each of said elements, said yoke having bearings at opposite ends.

a pin interposed through said bearings in each row of said elements for rotating said mechanically movable element with said pin as an axis from a first position in which said dark face is in substantially parallel flush relation with the inner surface of said display panel to a second position in which said bright face is in substantially flush relation with the inner surface of said display panel, and vice versa;

means for retracting each of said pins and each of said rows of mechanically movable elements under spring bias in a direction away from the inner surface of said display panel for conditioning a row of said movable elements for rotation from one said position to another said position;

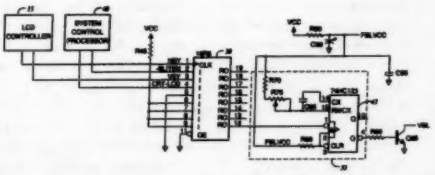
means comprising a comb having a plurality of teeth extended in the direction of said movable elements, which comb extends in a length direction of said display panel transverse to said pins, said comb constructed to be moved down under spring bias whereby said teeth contact said movable elements conditioned to rotate;

driving means for conditioning said mechanically movable elements to rotate from one said position to another said position, and driving means for driving a selected comb to move downward, whereby the teeth of said comb contact a conditional mechanically movable element in response to a code of preselected signals to move said movable elements to form a sign in accordance with said signals.

5,184,117
FLUORESCENT BACKLIGHT FLICKER CONTROL IN AN LCD DISPLAY

Lloyd W. Gauthier, St. Joseph, Mich., assignor to Zenith Data Systems Corporation, St. Joseph, Mich.

Filed Jun. 28, 1989, Ser. No. 373,017
Int. Cl.[5] G09G *3/36*
U.S. Cl. 340—784 **20 Claims**



1. A control circuit for driving a backlight for a display which mitigates noticeable flicker from the backlight comprising:

means for receiving a source of signals representative of horizontal sync signals which drive the display; and

means responsive to said receiving means for providing a backlight control signal of a predetermined frequency

synchronized to said horizontal sync signal which includes a counter, wherein said counter divides said horizontal sync signal by a predetermined number.

5,184,118

LIQUID CRYSTAL DISPLAY APPARATUS AND METHOD OF DRIVING SAME

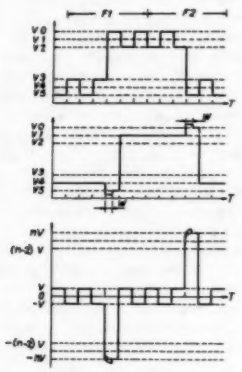
Katsunori Yamazaki, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 232,750, Aug. 15, 1988, Pat. No. 5,010,326. This application Feb. 23, 1990, Ser. No. 484,011

Claims priority, application Japan, Aug. 13, 1987, 62-202154; Feb. 9, 1988, 63-27922; Feb. 9, 1988, 63-27923; Feb. 9, 1988, 63-27924; Feb. 23, 1989, 1-43478

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—784 **21 Claims**



1. A liquid crystal display device having a plurality of picture elements which can be placed in lit and unlit states, comprising:

a first substrate;

a second substrate spaced apart from said first substrate;

a plurality of scanning electrodes and signal electrodes;

liquid crystal material disposed in the space between the substrates;

driving means for producing scan voltage waveforms and signal voltage waveforms, for supplying said scan voltage waveforms and signal voltage waveforms to said scanning electrodes and signal electrodes, respectively, whereby picture element voltages are applied across said picture elements, for periodically inverting the polarity of said scan voltage waveforms and signal voltage waveforms, and for producing at least one correction voltage combined with and for varying the voltage level of at least one of said scan voltage waveforms and signal voltage waveforms which are supplied to an associated picture element; and p1 wherein said scan voltage waveforms include at least one select signal and at least one non-select signal, said at least one correction voltage being produced at a time when the corresponding scan voltage waveform of a picture element changes between a select signal and non-select signal at or following said scan voltage and signal voltage polarity inversion.

5,184,119

UNAUTHORIZED UTILITY USE MONITOR APPARATUS AND METHOD

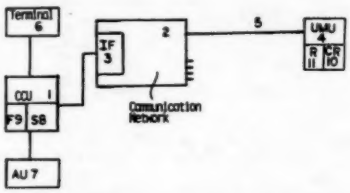
Evan J. Stanbury, Lakemba, and Lloyd S. Thomas, Gordon, both of Australia, assignors to Alcatel Australia Limited, Alexandria, Australia

Filed Jul. 6, 1990, Ser. No. 548,715

Claims priority, application Australia, Jul. 11, 1989, PJ 5156

Int. Cl.[5] H04B *1/00*

U.S. Cl. 340—825.60 **6 Claims**



1. A system for monitoring unauthorized use of a utility at each of a plurality of consumer's premises, the system including:

a consumer meter at each consumer's premises, the consumer meter being connected to measure use of the utility;

a local processor, including at least one memory register, at each consumer's premises operatively coupled to the consumer meter and for storing readings from the corresponding consumer meter, each consumer meter and local processor comprising a subscriber unit;

a communications network;

first communication means operatively coupled to the local processor and to the communications network, and disposed at each consumer's premises, for facilitating communication over the network with the subscriber unit;

a central processor at a central location including storage means for storing information concerning each consumer's premises;

second communication means operatively coupled to the communications network and the central processor, and disposed at the central location, for enabling information to be transmitted selectively between the central processor and each local processor via the communication network and the respective first communication means;

information input means operatively coupled to the central processor for generating an authorization signal for each consumer's premises, the storage means storing an authorization signal for each consumer's premises indicative of whether use of the utility is authorized or is not authorized;

wherein the central processor periodically polls each local processor to detect consumption of the utility, verifies whether or not consumption is authorized by checking the corresponding authorization signal in the storage means, and generates an unauthorized use signal when unauthorized use is detected at a corresponding consumer's premises.

5,184,120

MENU SELECTION USING ADAPTIVE FORCE SENSING RESISTOR

Charles P. Schultz, Hialeah, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1991, Ser. No. 680,474

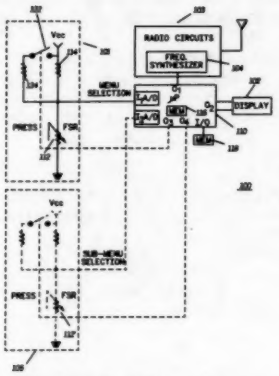
Int. Cl.[5] H03M *11/10*

U.S. Cl. 340—870.38 **9 Claims**

1. A method of menu selection, comprising the steps of:

calibrating a range of forces applied by a user on a force

sensitive resistor selector key to a selective range of forces required for selecting a plurality of menu items; and



associating a selective subset from said range of forces by said user to each selection of a menu item.

5,184,121

FIELD SENSOR COMMUNICATION METHOD AND SYSTEM

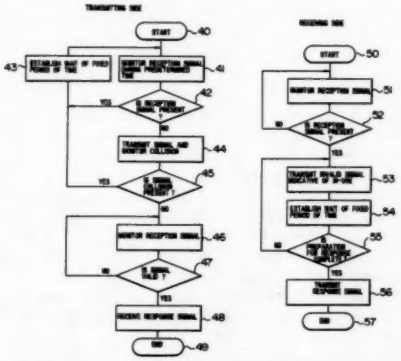
Makoto Kogure; Akira Sase, and Masao Fukunaga, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,124

Claims priority, application Japan, Mar. 3, 1989, 01-049837

Int. Cl.[5] G08C *19/16*

U.S. Cl. 340—870.11 **8 Claims**



1. A field sensor communication method for a communication system comprising a field sensor for detecting a physical quantity of a process and a communication unit, either said field sensor or said communication unit transmitting or receiving a transmission signal through a signal transmission line, the method comprising the steps of:

transmitting a first signal from a transmitting side of either said field sensor or said communication unit to said signal transmission line after detecting an absence of said transmission signal on said signal transmission line during a first period of time which is not shorter than a predetermined time period; and

transmitting a second signal from a receiving side of the other of either said field sensor or said communication unit indicative of in-use of said signal transmission line at an interval of time which is shorter than said predetermined time period, said second signal being transmitted during a second period of time after the first period of time until the receiving side transmits a response signal after having received the first signal transmitted from the transmitting side.

5,184,122

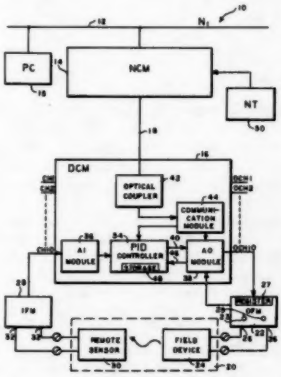
FACILITY MANAGEMENT SYSTEM WITH IMPROVED RETURN TO AUTOMATIC CONTROL

Gaylon Decious, Milwaukee, and Clay Nesler, New Berlin, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Jan. 31, 1991, Ser. No. 648,590

Int. Cl.[5] G05B *7/00*

U.S. Cl. 340—870.16 **32 Claims**



1. A control system wherein said automatic control means is of type which controls a parameter to maintain said parameter at a given set point, said control system comprising:

device means responsive to an automatic signal when under automatic control or a manually selected control signal when under manual control for effecting said parameter;

sensor means for sensing the level of said parameter and providing a feedback signal responsive to said sensed parameter level;

automatic control means coupled to said sensor means and being responsive to being coupled to said device means for generating an automatic control signal for said device means having a level derived from the sum of integral, derivative, and proportional actions to said feedback signal for automatically controlling said device means;

interface means coupled between said automatic control means and said device means for coupling said automatic control means to said device means to place said device means under automatic control and for decoupling said automatic control means from said device means for placing said device means under manual control of a manually selected control signal; and

said automatic control means being responsive to being decoupled from said device means by said interface means for terminating the generation of said automatic control signal and arranged for providing said automatic control signal to said device means at an initial level based upon the level of said manually selected control signal upon being recoupled to said device means by said interface means.

5,184,123

METHOD OF AND ARRANGEMENT FOR REPRESENTING TRAVEL GUIDING INFORMATION

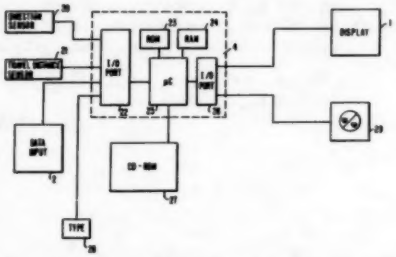
Wolfgang Bremer; Peter Knoll, and Frieder Heintz, all of Ettlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 322,775, Mar. 3, 1989, abandoned. This application Sep. 4, 1990, Ser. No. 578,897

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1988, 3806848

Int. Cl.[5] G08G *1/123*

U.S. Cl. 340—995 **8 Claims**



1. A method of representing point-referenced travel guiding information on a digitalizer screen forming a display of an electronic guiding and orienting device of a vehicle, said method comprising the steps of inputting a desired travel route on the digitalizer screen before start of travel along the desired travel route; representing the travel guiding information on the digitalizer screen at a distance from reference points including representing first travel guiding information required for a first reference point and second travel guiding information required for a second reference point; blocking the second travel guiding information for such a time until the vehicle reaches the first reference point for which the first travel guiding information is required; and adjusting the distance linearly in accordance with an instantaneous speed of the vehicle so that the distance increases with an increase of the instantaneous speed of the vehicle.

5,184,124

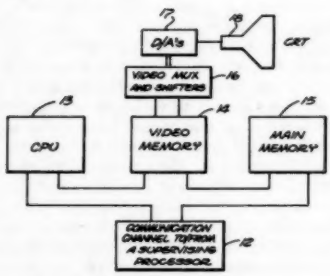
METHOD AND APPARATUS FOR COMPRESSING AND STORING PIXELS

J. Lane Molpus, Larkspur; Adam Levinthal, Redwood City, and Ross Werner, Woodside, all of Calif., assignors to Next Computer, Inc., Redwood City, Calif.

Filed Jan. 2, 1991, Ser. No. 637,598

Int. Cl.[5] H03M *7/30*

U.S. Cl. 341—50 **63 Claims**



1. A circuit comprising:

processing means for providing a memory address and a data word of a first number of bits;

storage means coupled to said processing means for storing said data word, said storage means having at least first and second address spaces;

address decoding means coupled to said processing means to determine if said memory address provided by said processing means is found in said first or second address space;

compression means coupled to said address decoding means, said processing means and to said storage means, said compression means for compressing said data word when said data word is written to said first address space.

5,184,125

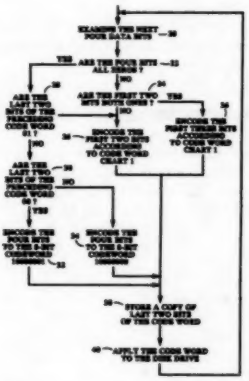
DATA ENCODING AND DEMODULATION SYSTEM

Lih-Jyh Weng, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 373,804, Jun. 28, 1989, abandoned. This application Nov. 22, 1991, Ser. No. 798,858

Int. Cl.[5] H03M *7/00*

U.S. Cl. 341—59 **42 Claims**



1. A method of storing data in a storage device in the form of demodulation code words generated from an input string of data bits using a rate ½, run-length limited d=2, k=7 code, the method including the steps of:

A. retaining in a buffer a predetermined number of bits of a previous demodulation code word, the retained bits being the demodulation code word bits which are at the end of the demodulation code word to which a next generated demodulation code word is to be appended;

B. encoding the right-most bits of the input string to generate demodulation code words and preliminary code words in accordance with the following:

DATA BITS	
	DEMODULATION CODE WORD
01	0100
111	100100
	PRELIMINARY CODE WORD
00	000X
10	100X
011	10000X
0000	1000000X

where the right-most bits of the data and the code words are the first in time;

C. for each preliminary code word examining a predetermined number of the bits retained in the buffer,

i. if the bits match a first predetermined pattern, appending

to the beginning of the preliminary code word a ONE bit to form a demodulation code word,

ii. if the bits do not match the first predetermined pattern, appending a ZERO bit to the beginning of the preliminary code word to form a demodulation code word,

D. retaining in the buffer a predetermined number of bits of the demodulation code word formed in steps B and/or C, the retained bits being the demodulation code word bits which are at the end of the demodulation code word to which a next demodulation code word is to be appended, and eliminating from the buffer the bits of the previous demodulation code word;

E. transmitting the demodulation code word to a storage device and appending the demodulation code word to the previous demodulation code word in the storage device;

F. removing from the input string the data bits encoded in steps B and/or C; and

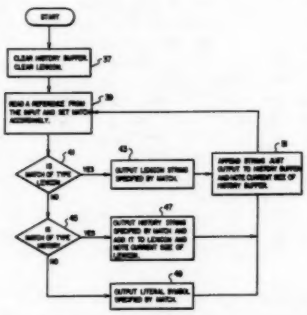
G. repeating steps C–F until the input string has been encoded.

5,184,126

METHOD OF DECOMPRESSING COMPRESSED DATA

Michael E. Nagy, Tampa, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1989, Ser. No. 458,116
Int. Cl.[5] H03M *7/40*
U.S. Cl. 341—67 **4 Claims**



1. A method of decompressing data made up of a sequence of literal references, history references, and lexicon references, which comprises the steps of:

a) reading a reference from said sequence;

b) emitting a lexicon string if said reference is a lexicon reference;

c) emitting a history string if said reference is a history reference;

d) adding the history string emitted in step c to a lexicon;

e) emitting a literal string if the reference is a literal reference;

f) adding the string emitted in step b, c or e to a history buffer; and,

g) repeating steps a through f until said sequence of references is exhausted.

5,184,127

SAMPLE-AND-HOLD DROOP COMPENSATOR FOR HIGH SPEED HIGH RESOLUTION ANALOG-TO-DIGITAL CONVERTER

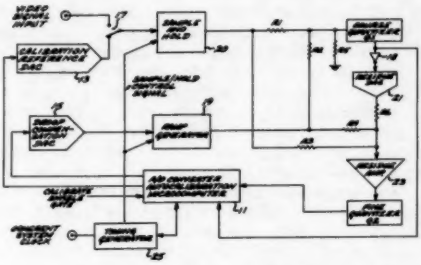
Terrence L. Myers, Fullerton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 19, 1991, Ser. No. 687,803
Int. Cl.[5] H03M *1/06*
U.S. Cl. 341—122 **5 Claims**

1. A droop compensation circuit for compensating droop of a sample-and-hold circuit output, comprising:

ramp generating means for producing a ramp signal synchronized with the hold timing of the sample-and-hold circuit;

means for adding said ramp signal to the sample-and-hold circuit output to provide an analog sum signal, said ramp



signal adjusted so as to tend to compensate the droop in the sample-and-hold circuit output; and

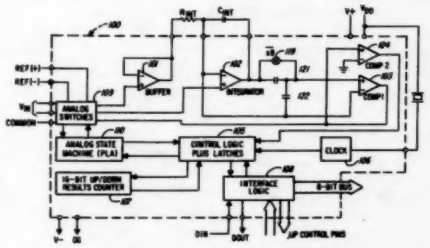
quantizing means for providing a digital representation of said analog sum signal.

5,184,128

INTEGRATING A/D CONVERTER WITH MEANS FOR REDUCING ROLLOVER ERROR

Dane R. Snow, Santa Clara, Calif., assignor to Harris Corporation, Melbourne, Fla.

Filed Aug. 6, 1991, Ser. No. 740,700
Int. Cl.[5] H03M *1/82*
U.S. Cl. 341—128 **22 Claims**



1. In an integrating type A/D converter having an input pair of terminals for receiving an unknown analog input voltage signal having one of positive and negative polarity states, an integrator coupled to said input terminals for providing an integrated signal to be converted to an output digital signal representing the analog input voltage signal,

the improvement therewith comprising:

means for detecting the polarity state of the unknown analog input voltage signal, and if the polarity state thereof is opposite from a predetermined one of said positive and negative polarity states, for converting the polarity state of the input voltage signal to the predetermined polarity state;

means for applying the analog input voltage signal which is in or converted to said predetermined polarity state to the integrator for integration and conversion to an output digital signal, whereby the input voltage signal applied to the integrator is always of the same predetermined polarity state in order to eliminate rollover errors;

wherein said means for detecting and converting the polarity state of the unknown analog input voltage signal comprises switch means including a control logic unit and a set of analog switches having closed and open states which

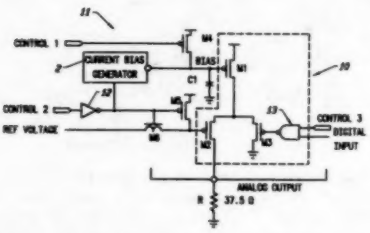
are settable by said control logic unit in response to detection of the polarity of the unknown analog input voltage signal, said switch means being operative for selectively connecting said pair of input terminals with said integrator in order to apply the input voltage signal to the integrator in said predetermined polarity direction; and

a pair of sources of reference voltages of predetermined high and low values corresponding to positive and negative polarity states of the input voltage signal, respectively, and said switch means being controlled by said logic control unit such that, during an integrate phase, the input voltage signal is applied to the integrator for a predetermined period of time in a polarity direction corresponding to said predetermined polarity state, wherein an integrated signal of the same polarity direction is provided at the output of said integrator, and then in a deintegrate phase, a reference voltage is applied to said integrator in an opposite polarity direction in order to deintegrate said integrated voltage signal to a predetermined level over a variable period of time corresponding to an amplitude of said integrated voltage signal.

5,184,129
SWITCHABLE DAC WITH CURRENT SURGE PROTECTION

Jimmy Fung, Cupertino; Jiu An, San Jose; David L. Campbell, Sunnyvale, and Steven Shyu, Cupertino, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 407,447, Sep. 13, 1989. This application Jun. 6, 1991, Ser. No. 712,146
Int. Cl.[5] H03M *1/66*
U.S. Cl. 341—144 **10 Claims**



1. In a digital-to-analog converter (DAC) having a plurality of stages, each of said stages having a current source coupled to a first and a second transistor which are operable as a differential pair, an apparatus for selectively switching said DAC between a normal operating mode and a sleep mode comprising:

means for providing a signal for switching said DAC between the DAC's normal operating mode and the DAC's sleep mode;

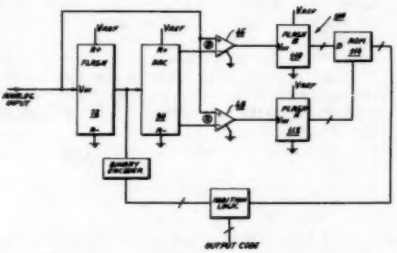
means for applying a potential to said first and said second transistors so as to render both of said first and said second transistors nonconductive when said DAC is switched from the DAC's normal operating mode to the DAC's sleep mode; and

means responsive to said signal providing means for allowing current to flow from said current source through at least one of said first and second transistors when said DAC is switched from the DAC's sleep mode the DAC's normal operating mode.

5,184,130
MULTI-STAGE A/D CONVERTER

Christopher W. Mangelsdorf, Reading, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Feb. 8, 1991, Ser. No. 652,583
Int. Cl.[5] H03M *1/36*
U.S. Cl. 341—156 **20 Claims**



1. A multi-stage A-to-D converter, comprising:

a first A/D stage arranged to receive an analog input signal to be converted to a first digital signal;

first reference signal means for said first stage arranged to produce at a set of nodal points a set of reference signal levels of different magnitudes for comparison with said analog input signal to provide for producing said first digital signal of at least one most-significant bit responsive to the value of said analog input signal;

residue means forming part of said first A/D stage for developing first and second analog residue signals representing, respectively, the differences between said analog input signal and two of said reference levels;

a second A/D stage for producing a second digital signal comprising at least one bit of less significance than said most-significant bit corresponding to at least one of said residue signals; and

second reference signal means for said second A/D stage including means for developing a reference signal responsive to both said first and said second residue signals.

5,184,131
A-D CONVERTER SUITABLE FOR FUZZY CONTROLLER

Hiroshi Ikeda, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 20, 1990, Ser. No. 540,591
Claims priority, application Japan, Jul. 6, 1989, 1-172961; Jul. 6, 1989, 1-172962; Jul. 6, 1989, 1-172963
Int. Cl.[5] H03M *1/38*
U.S. Cl. 341—165 **13 Claims**

1. An analog-to-digital converter, comprising:

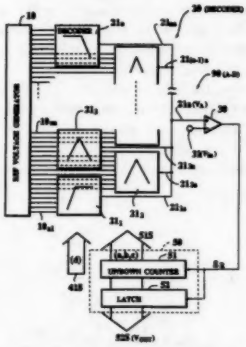
(a) reference voltage generating means for generating a plurality of different analog reference comparison voltages;

(b) decoder means connected to said reference voltage generating means and including at least one decoder block composed of plural array switches, for decoding a non-linear function coded by an arrangement of array switches to output the analog reference comparison voltages in response to digital signals in accordance with the coded function;

(c) at least one comparator means connected to said decoder means, for comparing the outputted analog reference comparison voltage with a voltage of an analog input signal to be converted and outputting a reset signal when the analog reference comparison voltage is substantially equal to the analog input signal voltage; and

(d) approximation register means connected to said at least one comparator and to said decoder means, for successively outputting the digital signals to said decoder means

to successively output the different analog reference comparison voltages to said comparator in accordance with the non-linear function and for outputting an A-D converted signal in response to the reset signal from said comparator, whereby the digital signals corresponding to



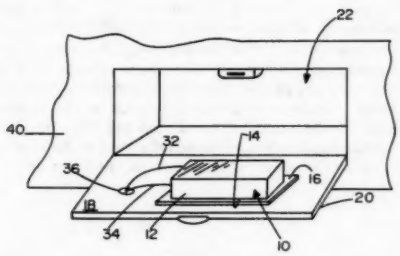
the analog signals can be obtained in accordance with the at least one non-linear function by selectively switching the array switches of said decoder means in response to the digital signals outputted from said approximation register means.

5,184,132

GARAGE DOOR OPENING DEVICE

William E. Baird, 697 S. Farben Dr., Diamond Bar, Calif. 91765

Filed Nov. 6, 1991, Ser. No. 788,493
Int. Cl.[5] H04Q *9/14*
U.S. Cl. 341—176 **2 Claims**



1. In an automobile having a dash board, a garage door opening device, including:

a garage door opener transmitter which provides a signal to a receiver that, upon receiving said signal, actuates a drive mechanism that opens a garage door, said transmitter being mounted to the dash board in a location normally hidden from view of a driver of the automobile,

said transmitter including a pair of terminals across which a manually operable switch element is connected, said switch element having means for connecting said switch element across said terminals, with said switch element extending through an opening in the dash board to expose said switch element to the view of the driver and within easy reach of the driver,

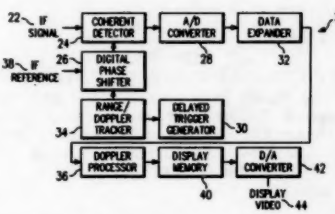
said transmitter being enclosed within a glove compartment in the dash board, said glove compartment having a door which opens and closes and the switch element extends through an opening in the door.

5,184,133

ISAR IMAGING RADAR SYSTEM

Sherman H. Tsao, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 26, 1991, Ser. No. 798,459
Int. Cl.[5] G01S *13/90*
U.S. Cl. 342—25 **25 Claims**



1. A method for improving ISAR imaging radar signal processing to compensate for range migration effects in the ISAR signal from a moving reflector, comprising the steps of:

measuring the sampled return, $f(\xi_i, t_\kappa)$ where i is the range bin index of the ISAR signal and κ is the ISAR signal PRI index, according to the formula,

$$f(\xi_i, t_k) = \sum_h P\left(\epsilon_i + 2\frac{D_h}{c} + \lambda\frac{sk}{cM}\right)e^{j\pi\frac{Dh}{\lambda}}e^{j2\pi\frac{sk}{M}},$$

for $i=0, 1, \ldots, N-1, \kappa=0, 1, \ldots, M-1$, and h representing a point source of the reflector;

resampling said return according to the formula

$$f(\zeta_i, t_k) = f\left(\xi_i - \frac{\lambda sk}{cM}, t_k\right),$$

for

$i=0, 1, \ldots, N-1$; and $\kappa=0, 1, \ldots, M-1$, for positive doppler frequency shift cells, $0<s\leqq M/2-1$, and computing the ISAR image from said cell compensations according to the formula

$$F(\zeta_i, S) = \left(\frac{1}{M}\right)\sum_{k=0}^{M-1} f(\zeta_i, t_k)\, e^{-j2\pi\frac{sk}{M}},$$

for $i=0, 1, \ldots, N-1$; and

resampling said return according to the formula

$$F(\zeta_i, t_k) = f\left(\xi_i + \frac{\lambda[M-s]k}{cM}, t_k\right)$$

for $i=0, 1, \ldots, N-1$; and $\kappa=0, 1, \ldots, M-1$, for negative doppler frequency shift cells, $M/2\leqq s\leqq M-1$, and computing the ISAR image from said cell compensations according to the formula

$$F(\zeta_i, S) = \left(\frac{1}{M}\right)\sum_{k=0}^{M-1} f(\zeta_i, t_k)\, e^{-j2\pi\frac{sk}{M}},$$

for $i=0, 1, \ldots, N-1$;

where:

ξ is the wave coordinate variable

t=time

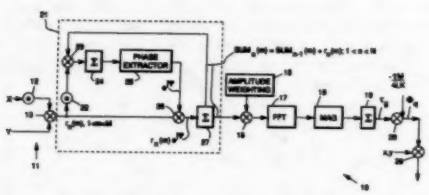
D is the initial displacement between the reference reflector and the arbitrary reflector
s is n integer variable indexing discrete speed
κ indexes the pulse number within the aperture
λ is the wave length of the radar signal
c is the speed of wave propagation
i indexes the sample number within one pulse return
$P(\xi)$ is the complex envelope of the transmitted pulse
$P'(\xi_i)$ is a sampled version of $P(\xi)$.

5,184,134

FAST PHASE DIFFERENCE AUTOFOCUS

Yoji G. Niho, Rancho Palos Verdes; Eric W. Day, Van Nuys, and Tammy L. Flanders, Playa Del Rey, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 27, 1991, Ser. No. 799,514
Int. Cl.[5] G01S *13/90*
U.S. Cl. 342—25 **8 Claims**



1. A fast phase difference autofocus method for removing phase errors from synthetic array radar signals, said method comprising the steps of:

dividing each range bin of the synthetic array radar data into two subarrays;

complex-conjugate multiplying the two subarrays together to produce a cross spectrum;

determining a complex phasor for the cross spectrum to align its phase so that the cross spectrum can be coherently added to the accumulated sum of cross spectrums from previously processed range bins;

multiplying the cross spectrum with the complex phasor and adding it to the accumulated sum of cross spectrums from previously processed range bins;

repeating the previous three steps for all range bins to form the final cross spectrum sum from all range bins;

applying an amplitude weighting function to the final cross spectrum sum;

performing an FFT to the amplitude-weighted cross spectrum sum to produce a cross correlation function;

magnitude-detecting the cross correlation function and determining a peak location of the cross correlation function;

multiplying the peak location by a scale factor to compute a center-to-end phase error estimate signal; and

generating a phase error correction signal and removing the phase error from the synthetic array radar data by multiplying the data with the phase error estimate signal.

5,184,135

PHASE MEASUREMENT OF RECEIVED PSEUDONOISE SEQUENCE USING DIGITAL CORRELATION

Ronald Y. Paradise, Hillsdale, N.J., assignor to GEC-Marconi Electronic Systems Corp., Wayne, N.J.

Filed Mar. 23, 1992, Ser. No. 856,549
Int. Cl.[5] G01S *13/44, 7/295*
U.S. Cl. 342—149 **7 Claims**

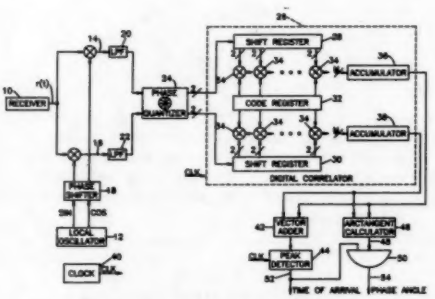
4. In a system where a phase modulated pseudonoise sequence signal is received by four antennas spaced as pairs in both azimuth and elevation, an arrangement for determining the azimuth and elevation phase differences of the signal received by the antennas comprising:

means for combining the signals received by the four antennas to obtain a sum signal which is the sum of all four received signals, an elevation difference signal which is equal to the difference between the sums of the signals received by the elevation spaced pairs of antennas, and an azimuth difference signal which is equal to the difference between the sums of the signals received by the azimuth spaced pairs of antennas, the combining means providing the following five signals:

a) a first signal which is said sum signal;

b) a second signal which is said sum signal plus said elevation difference signal phase shifted +90°;

c) a third signal which is said sum signal plus said elevation difference signal phase shifted −90°;



d) a fourth signal which is said sum signal plus said azimuth difference signal phase shifted +90°; and

e) a fifth signal which is said sum signal plus said azimuth difference signal phase shifted −90°; and

processing means including a digital correlator for processing said sum signal to provide a time of arrival signal, responding to said time of arrival signal for processing said second, third, fourth and fifth signals to provide phase signals representative of the phases relative to a local carrier of said second, third, fourth and fifth signals, calculating the elevation phase difference as the difference between the phases of the second and third signals and calculating the azimuth phase difference as the difference between the phases of the fourth and fifth signals.

5,184,136

PULSE RADAR AND COMPONENTS THEREFOR

Apostle G. Cardiasmenos, Acton, Mass., assignor to Raytheon Company, Lexington, Mass.

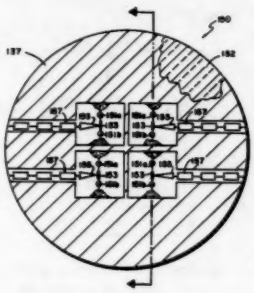
Filed Oct. 31, 1983, Ser. No. 552,548
Int. Cl.[5] G01S *13/44;* H04B *1/26*
U.S. Cl. 342—153 **7 Claims**

1. In a monopulse receiver operating in the 94 GHz band and higher bands, a first detector comprising:

(a) a first, a second, a third and a fourth balanced detector clustered about a central point on a common substrate, each one of such detectors including a pair of similarly poled beam-lead diodes;

(b) means for optically coupling, via the beam leads of each such diode, radio frequency signals to be detected;

(c) means for optically coupling first local oscillator signals to each pair of beam-lead diodes; and



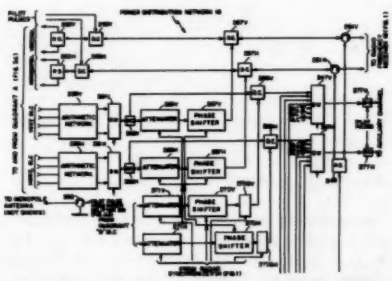
(d) an output line electrically connected to a junction between each pair of beam-lead diodes.

5,184,137

ALL WEATHER TACTICAL STRIKE SYSTEM (AWTSS) AND METHOD OF OPERATION

Jerome H. Pozgay, Needham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Dec. 29, 1980, Ser. No. 234,037
Int. Cl.[5] G01S 7/40
U.S. Cl. 342—174 **1 Claim**



1. The method of calibrating nominally identical receiver channels in an airborne radar using a phased array antenna divided into quadrants to permit monopulse operation when desired, such antenna being gimballed within a radome, such method comprising the steps of:

(a) periodically orienting the phased array antenna to direct the boresight line of such antenna toward a predetermined point on the radome;

(b) isotropically radiating, from the geometric center of the phased array antenna, a pilot pulse to provide, at the phase center of each quadrant of such antenna, an equi-phase and equi-amplitude signal at the operating frquency of the airborne radar;

(c) processing the equi-phase and equi-amplitude signal at each phase center in a different one of the receiver channels; and

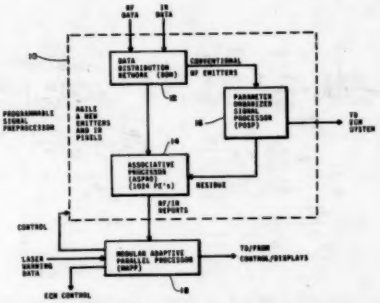
(d) comparing the output signals from each one of the receiver channels to a corresponding reference signal to derive the desired calibration signals in accordance with the differences existing between each one of such output signals and the corresponding reference signal.

5,184,138

DATA DISTRIBUTION NETWORK

James W. Terry, Plano, Tex., and John P. Rasmussen, Clinton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 22, 1987, Ser. No. 67,578
Int. Cl.[5] G01S 7/44
U.S. Cl. 342—195 **2 Claims**



1. A data distribution network (DDN) which improves processing throughputs (eight million bytes per second) whenever high data rates of unsorted data are supplied to a processing system input via a 64-bit line, wherein said data distribution network includes coarse steering logic, fine steering logic, and assignment logic for partially sorting and filtering data so that subsequent analysis procedures can find the data in a more orderly form, combining synthetic (hash) addresses with look-up tables;

wherein the course steering logic comprises a first course selector unit for selecting data either from said processing system input or from a global memory via a global memory interface unit, with data organized into input words, coarse hashing means coupled to receive data from the first course selector unit, using 14 of the 64 available input bits of each input word to decide to which of 16,384 (16K) bins the intercept belongs, means for reducing the 16K bins to 1K bins comprising a second course selector unit for selecting data either from said course hashing means or from the global memory via the global memory interface unit, the output of the second course selector unit being coupled to a course selector memory, and the output of the course selector memory being coupled for input to the fine steering logic, and also to the global memory via the global memory interface unit;

wherein the fine steering logic includes first and second fine hashing means, each coupled to receive data from the course selector memory and also from the first course selector unit, for accepting the reduced classification output from the coarse steering memory and adding to it some more raw data from the input word, a first fine selector unit coupled between the first fine hashing means and a first fine steering memory, and a second fine selector unit coupled between the second fine hashing means and a second fine steering memory, so that the fine steering logic actually performs two sorts on the itercept and uses the result of one sort to decide which of the two sort outputs will be used, with the final sort output containing a class number of the input words and the operation that will be performed in the assignment logic;

wherein the assignment logic includes means for producing the address of the final storage location for the input word in one of the input word's possible destinations, and also means for providing an environment filter that cuts off further processing of the signal if a count within a given class of intercepts has exceeded a programmable upper limit.

5,184,139

ANTENNA POINTING EQUIPMENT

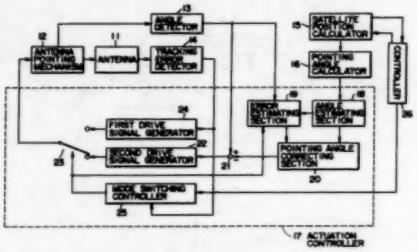
Keiichi Hirako, Yokohama, and Yoshihisa Kawaguchi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 27, 1991, Ser. No. 750,602

Claims priority, application Japan, Aug. 29, 1990, 2-229211; Aug. 29, 1990, 2-229212

Int. Cl.[5] H04B *7/185*

U.S. Cl. 342—354 **8 Claims**



1. An antenna pointing equipment for directing an antenna carried on a space navigation satellite to a target comprising:

pointing mechanism angle detecting means for detecting a pointing mechanism angle of said antenna;

reference angle estimating means for estimating a theoretical reference angle of said antenna on the basis of orbital elements of said space navigation satellite and said target;

error estimating means for obtaining an error of said theoretical reference angle from a difference between said pointing mechanism angle of said antenna detected by said pointing mechanism angle detecting means and said reference angle estimated by said reference angle estimating means;

correcting means for correcting said reference angle on the basis of said error obtained by said error estimating means;

acquisition control means for controlling the direction of said antenna on the basis of said reference angle corrected by said correcting means to acquire said target;

pointing error detecting means for detecting a pointing error of said antenna relative to said target in a state in which said target is acquired by said acquisition control means; and

tracking control means for controlling the direction of said antenna so as to correct said pointing error obtained by said pointing error detecting means to thereby track said target.

5,184,140

ANTENNA SYSTEM

Kenichi Hariu; Isamu Chiba, and Seiji Mano, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 25, 1991, Ser. No. 660,692

Claims priority, application Japan, Feb. 26, 1990, 2-44721

Int. Cl.[5] H01Q *3/22, 3/24, 3/26*

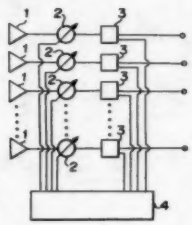
U.S. Cl. 342—372 **13 Claims**

1. An antenna system comprising:

a plurality of element antennas;

a plurality of variable phase shifters and a plurality of variable amplitude type devices connected to said plurality of element antennas respectively, and

an arithmetic unit used to perform an arithmetical operation of the excitation amplitude and phase for exciting each of said plurality of element antennas, said arithmetic unit including the following means (a) thorough (g) and performing the arithmetical operation of the excitation amplitude and phase used to define a desired radiation pattern composed by each of said plurality of element antennas with respect to a preset allowable variation width D of the excitation amplitude;



(a) means for calculating the antenna gain G_j (j=1 to J) in accordance with the following equation:

$$G_j = \sum_{i=1}^{I} (A_i \cdot P_{ij})^* \cdot (A_i \cdot P_{ij}) / (A_i^* \cdot A_i)$$

wherein

J=total number of inputted evaluation points

I=total number of elements antennas

P_{ij}=patterns of array elements

A_i=initial excitation amplitude and phase

i=1 to I

j=1 to J

*=complex conjugate

(b) means for determining the combination or set of values of A_i (i=1 to I) which provides a solution for minimizing an evaluation function F represented by the following equation:

$$F = \sum_{j=1}^{J} W_j |G_j - G_{oj}|^2$$

where

G_j (j=1 to J)=antenna gain obtained in accordance with the equation represented by said means (a)

G_{oj}=inputted desired antenna gain

W_j=weighting factor

j=1 to J

(c) means for standardizing the excitation amplitude a_i with the maximum value M provided that $a_i = |A_i|$. M=Max. a_i; (i=1 to I) in the set of the values of A_i obtained from the above means (b) to thereby replace the value of the excitation amplitude a_i, which is defined to make the value thus standardized below the allowable variation width D of the excitation amplitude, by M.D.

(d) means for fixing all the excitation amplitude a_i (i=1 to I) obtained from the above so as to determine the set of the excitation phase p_i (i=1 to I), which provides a solution for minimizing the evaluation function F represented by the following equation:

$$F = \sum_{j=1}^{J} W_j |G_j - G_{oj}|^2$$

where

$p_i = \tan^{-1} I_A i / R_A i$

$R_A i$=real part of A_i

$I_A i$=imaginary part of A_i

(e) means for calculating G_j (j=1 to J) with respect to the set of the values of A_i (i=1 to I) obtained from a_i and p_i determined from the above, in accordance with the following equation:

$$G_j = \sum_{i=1}^{I} (A_i \cdot P_{ij})^* \cdot (A_i \cdot P_{ij})/(A_i^* \cdot A_i)$$

where the asterisk * represents the complex conjugate

(f) means for regarding a_i, p_i (i=1 to I) thus obtained as being desired excitation amplitude and phase, respectively, if all G_j obtained from the equation in said means (e) exceeds a desired antenna gain G_{oj} (j=1 to J), thereby terminating the arithmetical operation of the excitation amplitude and phase, and for making a judgment on an advance to the following step if it is below the desired antenna gain G_{oj}.

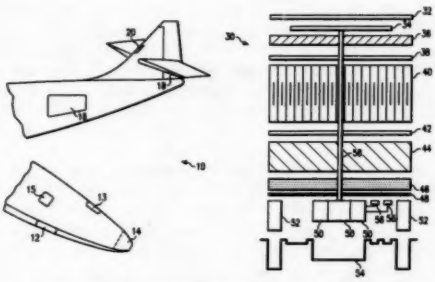
(g) means for making a judgment as to whether or not G_j is greater than G_{oj} in response to the determination that all G_j has been below the desired antenna gain G_{oj}, thus setting in such a manner that if $G_j \geqq G_{oj}$, then $W_j = 0$ and if $G_j < G_{oj}$, then $W_j = 1$ (j=1 to J), and for utilizing A_i (i=1 to I) obtained from the above means (b) as the initial excitation amplitude and phase and then returning again to the above means (a) so as to execute the arithmetical operation of the excitation amplitude and phase.

5,184,141

STRUCTURALLY-EMBEDDED ELECTRONICS ASSEMBLY

Jerome J. Connolly; Michael D. Barrick, both of Arlington; William L. D'Agostino, Irving; Gerald F. Thomas, Arlington, and Thomas W. Williams, Grand Prairie, all of Tex., assignors to Vought Aircraft Company, Dallas, Tex.

Filed Apr. 5, 1990, Ser. No. 505,757
Int. Cl.[5] H01Q *1/280, 1/420, 13/000*
U.S. Cl. 343—705 **23 Claims**



1. A structurally-embedded electronics assembly for integration with the load-carrying structure of a vehicle, said structurally-embedded electronics assembly comprising:

an outer skin member;

a primary load-carrying member positioned inboard from said outer skin member, said primary load-carrying member being structured for attachment to the load-carrying structure of the vehicle;

a honeycomb core member positioned between said primary load-carrying member and said outer skin member;

an electronics structure positioned between said outer skin member and said honeycomb core member;

a thermally conductive baseplate member positioned on the side of the primary load-carrying member which is away from said core member; and

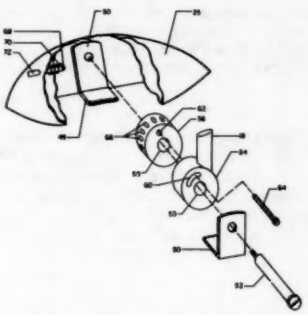
a layer of acoustic damping adhesive operatively positioned between said primary load-carrying member and said thermally conductive baseplate member.

5,184,142

AUTOMOTIVE VEHICLE ANTENNA

Kurt P. Hornburg, 21W732 Glen Valley Dr.; Wayne A. Thelen, and William Thelen, both of 21W722Glen Valley Dr., all of Glen Ellyn, Ill. 60137

Filed Nov. 5, 1990, Ser. No. 609,439
Int. Cl.[5] H01Q *1/100, 1/400, 1/120*
U.S. Cl. 343—715 **20 Claims**



1. An antenna for use on an automotive vehicle comprising:

a conductive antenna element having a lower end;

an antenna base connected to said lower end and having a central opening;

a cylindrical collar for defining a preferred position for said conductive antenna element and having a central opening in alignment with said central opening in said base, said collar disposed adjacent said base and in engagement with said base and comprising a plurality of circumferentially spaced-apart indentations;

an antenna pivot support for pivotally supporting said base and said collar; and

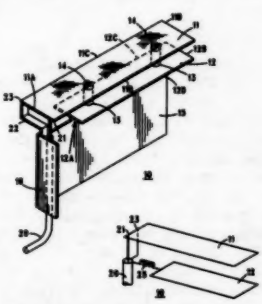
a position adjustment device comprising a retractable retaining pin for engaging said indentations for allowing pivoting movement of said antenna when said pin is in a retracted position and for positioning said antenna in a selected upright orientation when said pin is in engagement with a predetermined one of said indentations.

5,184,143

LOW PROFILE ANTENNA

Paul D. Marko, Pembroke Pines, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 359,827, Jun. 1, 1989, abandoned. This application Feb. 26, 1991, Ser. No. 660,974
Int. Cl.[5] H01Q *9/30*
U.S. Cl. 343—749 **6 Claims**



1. A low profile antenna comprising:

a substantially rectangular driven plate having a first and a

second connection located along an edge of the width thereof,

a substantially rectangular ground plate spaced parallel from the driven plate,

a feedpoint located at said first connection along said edge of the driven plate,

a coaxial transmission line is coupled to the antenna,

the coaxial transmission line center conductor is connected to the edge of the driven plate, inductive means located underneath and parallel to the driven plate couples the coaxial transmission line shield to the ground plate, and

ground connecting means connected to the coaxial transmission line shield and to said edge of the driven plate at said second connection spaced from the feedpoint.

5,184,144

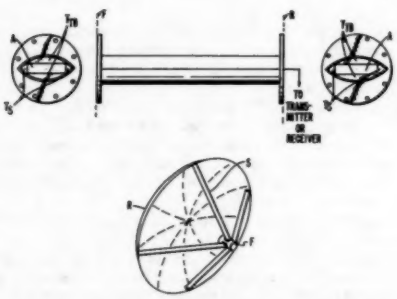
OGIVAL CROSS-SECTION COMBINED MICROWAVE WAVEGUIDE FOR REFLECTOR ANTENNA FEED AND SPAR SUPPORT THEREFOR

David M. Thombs, Chelmsford, Mass., assignor to Chu Associates, Inc., Littleton, Mass.

Filed Sep. 25, 1990, Ser. No. 587,411

Int. Cl.[5] H01Q *1/22*

U.S. Cl. 343—781 R **4 Claims**



1. A microwave antenna feed support for supporting a microwave antenna feed relative to a reflector, comprising a spar of ogival cross-section defined by two arcuate walls symmetrical about a common chord and meeting one another at acute angles to form edges of the spar, the spar having one end which is supported near a rim of the reflector, another end which connects to the antenna feed, and an internal surface of highly conductive material, and being internally cross-dimensioned with respect to the microwave wavelength to serve also as a waveguide for feeding microwave energy to and/or from the antenna feed, and further wherein the spar is terminated at said ends thereof by circular flanges of larger transverse dimensions and having rectangular waveguide transition apertures within and bounded by the ogival cross-section.

5,184,145

DISMOUNTABLE AND AIR-TRANSPORTABLE ANTENNA FOR TWO-WAY TELECOMMUNICATIONS WITH A SATELLITE

Yves Devillers, Paris; Frédéric Neveu, Carrieres Sous Poissy; Roger Behe, Cap D'ail, and Pierre Ramat, Rueil Malmaison, all of France, assignors to Minister of the Post, Telecommunications and Space (Centre National D'Etudes Des Telecommunications), Issy Les Moulineaux, France

Filed Jul. 5, 1990, Ser. No. 547,083

Claims priority, application France, Jul. 6, 1989, 89-09092

Int. Cl.[5] H01Q *1/080, 3/020, 15/160, 19/130*

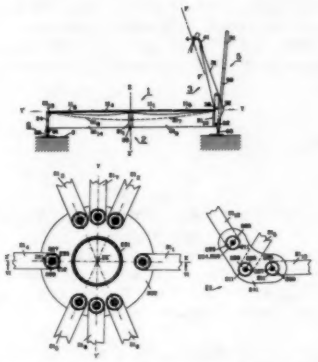
U.S. Cl. 343—840 **15 Claims**

1. A telecommunication antenna comprising

a substantially prismatic frame having a polygonal shape with lower and upper bases, said frame comprising plural substantially rectangular separable frame panels extending substantially perpendicular to said lower base, said frame panels being divided into peripheral panels forming faces of said frame and interior panels located between the center of said frame and edges of said frame formed between said peripheral panels,

peripheral tubes carried respectively by said peripheral panels and interior panels, said tubes being located substantially at said frame edges and extending substantially perpendicularly to said frame bases, and plural dismountable peripheral means, each arranged to connect two peripheral tubes of two adjacent peripheral panels and one interior panel, all of which are adjacent each other,

interior tubes carried by said interior panels, the interior tubes extending perpendicularly to said frame based and located substantially at said center of said frame and dismountable hub means for connecting all said interior tubes of said interior panels,



a parabolic reflector having plural separable reflector elements, each of said reflector elements being thin with a substantially uniform thickness and having at least two perpendicular rectilinear edges respectively parallel to two perpendicular medial axes of said reflector, said frame panels each having a curved upper side which is located at the level of said upper frame base and conformed to the parabolic convex face of said reflector, and

dismountable securing means for securing each of said reflector elements onto said curved upper sides of at least one of said peripheral panels and one of said interior panels whereby said rectilinear edges of said reflector elements abut against each other to form a continuous parabolic face of said reflector.

5,184,146

COLOR IMAGE FORMING METHOD AND APPARATUS

Kazuyoshi Tanaka; Toshifumi Isobe; Masahiko Itaya, and Akiko Naganuma, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 27, 1990, Ser. No. 558,512

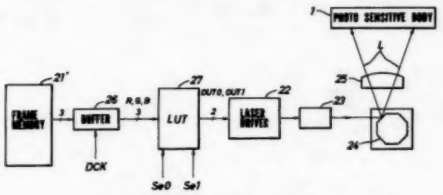
Claims priority, application Japan, Jul. 29, 1989, 1-197836; Aug. 11, 1989, 1-209257

Int. Cl.[5] H04N *1/21*

U.S. Cl. 346—1.1 **13 Claims**

4. A color image forming method for forming color images comprising selecting color image data of mono-color from color image data of a plurality of colors, irradiating a laser light onto a uniformly electrically charged photosensitive surface on the basis of the selected color image data to form a latent image on said photosensitive surface and developing said latent image to form toner images of a plurality of colors sequentially

characterized by that exposure potential provided by a first image exposure is equalized substantially to a surface potential



of a toner layer provided by exposure on the toner layer by modulation of light intensity of said laser light.

5,184,147

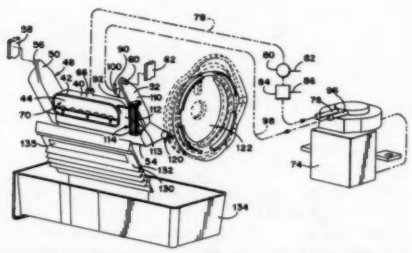
INK JET PRINT HEAD MAINTENANCE SYSTEM

Donald B. MacLane, Portland; Ted E. Deur, Hillsboro, both of Oreg.; Jeffrey J. Anderson, Camas, Wash.; Donald R. Titterington, Tualatin, Oreg.; James C. Oswald, Beaverton, Oreg., and Richard S. Meissner, Portland, Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Apr. 22, 1991, Ser. No. 688,758

Int. Cl.[5] B41J *2/165*

U.S. Cl. 346—1.1 **34 Claims**



34. A method of maintaining an ink jet print head comprising:

positioning a purge chamber against an ink jet nozzle orifice surface to form a closed interior about the ink jet nozzle orifice surface, the purge chamber including an ink receiving opening which communicates with the interior of the purge chamber a baffle extending substantially across the ink receiving opening;

drawing a vacuum in the purge chamber through a vacuum port;

ejecting ink through nozzle orifices in the nozzle orifice plate into the purge chamber to strike the baffle, intercepting the ink within the purge chamber and deflecting the ink away from the vacuum port.

5,184,148

INK JET RECORDING HAVING AN INK WITH CARBON BLACK

Yuko Suga, Tokyo, and Masako Shimomura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1990, Ser. No. 598,378

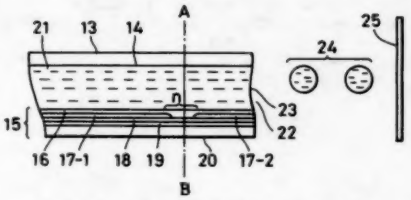
Claims priority, application Japan, Oct. 19, 1989, 1-273044; Aug. 31, 1990, 2-230271

Int. Cl.[5] B41J *2/05*; C09D *11/02*

U.S. Cl. 346—1.1 **31 Claims**

17. An ink jet recording method comprising the step of:

applying to a recording material ink droplets that are discharged from orifices of an ink jet recording head by applying to said ink heat energy that corresponds to a recording signal, wherein said ink comprises an aqueous medium containing acid carbon black having a volatile content within the range of 3.5 to 8% by weight of the total weight of the carbon black and a water-soluble resin having a weight average molecular weight within the



range of 3,000 to 30,000, wherein the weight ratio of said acid carbon black to said water-soluble resin is within the range of 3:1 to 10:1, and wherein said step is performed on-demand.

5,184,149

COMBINATION OF MAGNETIC CARD AND PRINTING APPARATUS THEREFOR

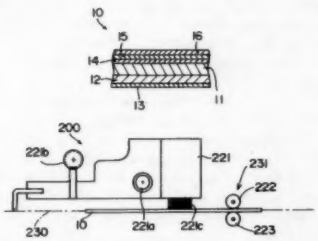
Tsugutoshi Tanaka, and Soji Ishiwata, both of Kanagawa, Japan, assignors to Nippon Aleph Corporation, Kanagawa, Japan

Filed Oct. 16, 1991, Ser. No. 777,128

Claims priority, application Japan, Aug. 23, 1991, 3-74285

Int. Cl.[5] G11B *9/00*; G01D *9/00*

U.S. Cl. 346—74.2 **25 Claims**



1. In a combination of a magnetic card and a printing apparatus therefor,

said magnetic card comprising a substrate made of a non-magnetic material, a printing surface on at least a part of one side of said substrate, said printing surface having a coloring layer, a conductive layer and a protective layer, said coloring layer being located on the one side of said substrate, and said conductive layer being located between said coloring layer and said protective layer, said magnetic card further including a magnetic recording layer formed on one of the one and other sides of said substrate, magnetic information being magnetic-recorded on said magnetic recording layer; and

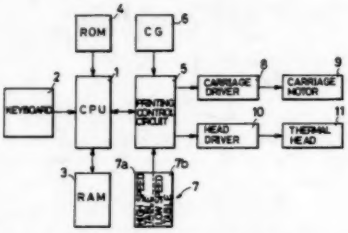
said printer comprising electrosensitive means for discharge-breaking down said protective layer and said conductive layer of said printing surface, into a character pattern corresponding to said magnetic information magnetic-recorded on said magnetic recording layer, to expose at least a part of said coloring layer in at least an area of said protective layer and said conductive layer which is discharge-broken down, thereby indicating said character pattern.

5,184,150

THERMAL PRINTER FOR PROVIDING PRINTED CHARACTERS WITH A UNIFORM DENSITY

Yukihiko Sugimoto, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 3, 1990, Ser. No. 562,193
Claims priority, application Japan, Aug. 7, 1989, 1-204276
Int. Cl.[5] B41J *2/38, 2/365*
U.S. Cl. 346—76 PH **5 Claims**



1. A thermal printer for providing printed characters with a uniform density and for constantly applying proper energy to dot heating elements either in a high-speed printing mode or in a low-speed printing mode, said thermal printer comprising:

a high-speed printing table containing defined pulse widths respectively for a printing hysteresis of a current bit to an N-th previous bit, wherein N represents a positive integer;

a low-speed printing table containing defined pulse widths respectively for a printing hysteresis of a current bit to an M-th previous bit, wherein M represents a positive integer which is smaller than said N;

means connected to both said high-speed printing table and said low-speed printing table for selecting a printing mode of said thermal printer;

means connected to said mode selecting means for selecting either said high-speed printing table or said low-speed printing table in response to a selected printing speed mode in accordance with said printing mode selecting means;

means for determining a printing hysteresis of a current bit to said N-th or said M-th previous bit;

means for selecting a pulse width at an address location on either said high-speed printing table or said low-speed printing table as selected by said table selecting means, said pulse width being selected in accordance with the printing hysteresis of said current bit of said selected printing table; and

means for adjusting a time when a current flows through each of necessary dot heating elements to a time defined by said selected pulse width on either said high-speed printing table or said low-speed printing table as selected by said table selecting means.

5,184,151

THERMAL TRANSFER RECORDING APPARATUS AND FACSIMILE APPARATUS

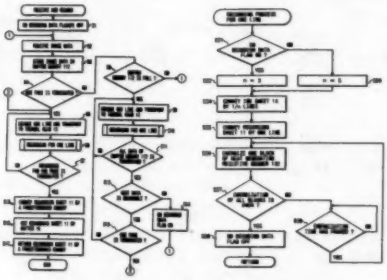
Takeshi Ono, Yokohama; Takehiro Yoshida, Tokyo; Satoshi Wada, Kawasaki; Tomoyuki Takeda, Yokohama; Masaya Kondo, Tokyo; Makoto Kobayashi, Tama; Takahiro Kato; Takashi Awai, both of Yokohama; Yasushi Ishida, Tokyo; Akihiro Tomoda, Yokohama; Minoru Yokoyama, Yokohama, and Masakatsu Yamada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1991, Ser. No. 648,861
Claims priority, application Japan, Feb. 5, 1990, 2-024403
Int. Cl.[5] B41J *17/00, 33/00*
U.S. Cl. 346—76 PH **18 Claims**

1. A thermal transfer recording apparatus for transferring an ink contained on an ink sheet onto a recording medium to record an image on said recording medium, comprising:

conveying means for relatively conveying said ink sheet and said recording medium;

recording means for recording on said recording medium using said ink sheet; and



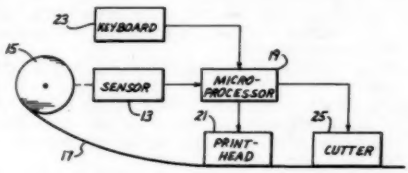
control means for controlling to make a conveyance amount by which said ink sheet is conveyed at a time of starting a recording operation large if the recording operation has been suspended after a predetermined quantity of an image data has been recorded by said recording means.

5,184,152

PRINTING APPARATUS AND METHOD FOR PRINTING ON AN ELONGATED MEMBER SUCH AS A TUBE

John B. French, San Clemente, Calif., assignor to Sumimoto Electric Interconnect Products, Inc., Sunnyvale, Calif.

Filed Dec. 4, 1990, Ser. No. 624,883
Int. Cl.[5] B41J *3/407*
U.S. Cl. 346—76 PH **22 Claims**



1. A printing apparatus for printing on an elongated member wherein encoded information relating to at least one characteristic of the elongated member is associated with the elongated member, said printing apparatus comprising:

a supporting structure;

a controllable printer mounted on the supporting structure for printing on the elongated member, said printer including a printhead;

sensor means for sensing the encoded information;

means for controlling the printer in accordance with the encoded information whereby the printer is controlled in accordance with said characteristic of the elongated member, said controlling means including means for justifying the printhead from a central region of the printhead; and

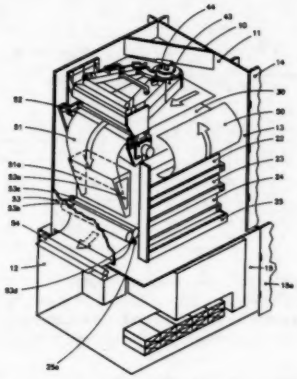
means for centering the elongated member on the central region of the printhead.

5,184,153

COMPACT LASER PRINTER WITH LIGHT TIGHT COMPARTMENT ACCESS

Steven D. Daniels, Churchville; Mark D. Bedzyk, Rochester; Roger S. Brahm, Canandaigua, and Anthony M. Olexy, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 4, 1991, Ser. No. 637,429
Int. Cl.[5] H04N *1/21*
U.S. Cl. 346—108 **7 Claims**



1. An easily serviced laser printer having compactness attributes, comprising:

a light tight compartment formed by a rear wall, and left and right side walls extending forwardly from said rear wall toward the front of the printer, and a front closure door providing access to the interior of the compartment from the front, said compartment containing:

a sheet registration station,

a sheet exposure station located toward a first side wall from said registration station,

means for moving a sheet toward said first side wall from said registration station to said exposure station,

a laser optical station over said registration station for directing a modulated laser beam to said exposure station,

means located under said registration station for storing a supply of light sensitive sheets, said storing means being accessible from the front of the printer for sheet loading into said storing means in a front-to-rear direction, and

means located in front of said storing means and moveable up and down in front of said storing means for receiving a sheet from said storing means by movement of the sheet in a rear-to-front direction, then moving said sheet upwardly to said registration station to feed the sheet in a front-to-rear direction into the front of said registration station, and then moving back down to said storing means to receive another sheet.

5,184,154

METHOD AND APPARATUS FOR IMAGE PRODUCTION BY SELECTIVE OR RANDOM EXPOSURE ELEMENT ACTIVATION

Kerry L. Shaklee, Brighton, Colo., assignor to Alliant Techsystems Inc., Edina, Minn.

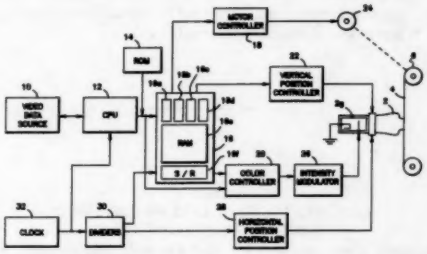
Filed Sep. 26, 1990, Ser. No. 588,231
Int. Cl.[5] G01D *15/14*; H04N *3/16, 1/23*
U.S. Cl. 346—110 R **17 Claims**

8. Apparatus for producing on an image receiving medium an image formed of a sequence of adjacent image lines from stored image data representative of individual image lines, comprising:

first means for receiving the stored image data and for producing on the image receiving medium the image representative of the individual image lines, the first means including a plurality of parallel adjacent exposure elements which are individually and selectively activated to produce an adjacent image line on the image receiving medium;

second means for controlling the activation of the exposure elements so that no two adjacent image lines on the image receiving medium are produced by adjacent exposure elements; and

third means responsive to the second means for stepping the image receiving medium past the exposure elements so the image receiving medium moves one adjacent image line between activations of the exposure elements.



17. Apparatus for producing on a image receiving medium an image formed of a sequence of adjacent image lines from stored image data representative of individual image lines, comprising:

first means for receiving the stored image data and for producing on the image receiving medium the image representative of the individual image lines, the first means including a plurality of parallel adjacent exposure elements which are individually activated to produce an adjacent image line on the image receiving medium;

second means for controlling the activation of the exposure elements in a random order; and

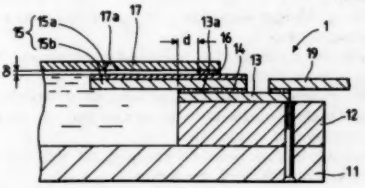
third means responsive to the second means for stepping the image receiving medium past the exposure elements so the image receiving medium moves one image line between activation of the exposure elements.

5,184,155

INK JET PRINT HEAD

Shuji Yonekubo; Tsuyoshi Kitahara; Tatsuo Furuta; Takahiro Katakura, and Naomi Serizawa, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 9, 1990, Ser. No. 611,620
Claims priority, application Japan, Nov. 10, 1989, 1-292601; Feb. 15, 1990, 2-34748; Mar. 24, 1990, 2-74147
Int. Cl.[5] B41J *2/045*
U.S. Cl. 346—140 R **6 Claims**



1. An ink jet print head comprising:

a supporting body,

a plurality of piezoelectric conversion elements fixed to said supporting body at base ends thereof in a cantilevered manner such that an edge of said supporting body acts as a fulcrum of said piezoelectric conversion elements,

a nozzle plate positioned over said piezoelectric conversion elements with a gap therebetween, and

an adhesive for fixing said nozzle plate to said piezoelectric conversion elements at said base ends of said piezoelectric conversion elements, said adhesive terminating such that said gap extends inward of said fulcrum toward said base ends and said piezoelectric conversion elements by a distance;

wherein said distance at least exceeds a length of a region of stress concentration toward said base ends of said piezoelectric conversion elements from said fulcrum, said stress concentration being caused when said piezoelectric conversion elements are subjected to thermal stress; and

wherein said distance is at least 0.5 mm.

5,184,156

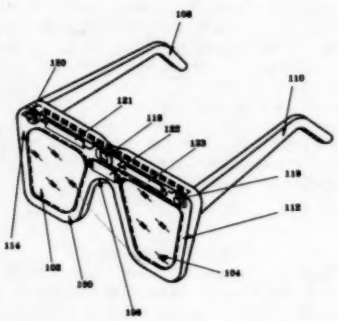
GLASSES WITH COLOR-SWITCHABLE, MULTI-LAYERED LENSES

Michael Black, Foster City, and Vladimir Kupershmidt, Fremont, both of Calif., assignors to Reliant Laser Corporation, Foster City, Calif.

Filed Nov. 12, 1991, Ser. No. 789,994

Int. Cl.[5] G02C *7/10*

U.S. Cl. 351—158 **17 Claims**



1. A pair of multilayered-lens, color-switchable glasses, comprising:

a frame having a rim portion and temples;

multilayered lens means for selectively filtering incident radiation, said multilayered lens means being mounted within said rim portion, said multilayered lens means being arranged to change color in response to an electrical input thereto;

photodetector means for determining the intensity level of incident radiation;

color-switching means for supplying an electrical input to said multilayered lens means for changing the color of said multilayered lens means;

electronic control means for changing the optical properties of said multilayered lens means;

an electronic circuit connected to said electronic control means; and

power supply means for supplying electrical energy to said control means via said electronic circuit.

5,184,157

OPHTHALMIC MEASUREMENT APPARATUS

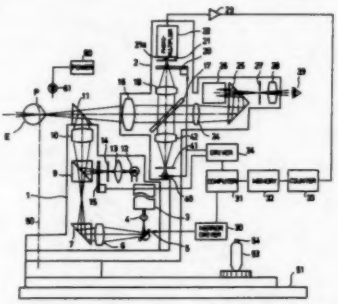
Tadashi Ichihashi, and Koichi Akiyama, both of Tokyo, Japan, assignors to Kowa Company Limited, Japan

Filed May 30, 1990, Ser. No. 530,290

Claims priority, application Japan, Jun. 29, 1989, 1-165207

Int. Cl.[5] A61B *3/10*

U.S. Cl. 351—208 **15 Claims**



1. An ophthalmic measurement apparatus in which a laser beam is projected at a selected point in a measurement zone within an eye to be examined and light scattered therefrom is photoelectrically detected for ophthalmic measurement, comprising:

a laser source for producing a laser beam;

projecting means for projecting the laser beam to converge it to the point in the measurement zone;

a light receiving section provided with a photosensor for photoelectrically detecting scattered laser light from the measurement zone via a measurement mask having an aperture of a prescribed size and positioned conjugate with the point of convergence of the laser beam;

deflecting means for deflecting the laser beam in a prescribed direction for scanning the area of the measurement zone during alignment of the eye and during measurement;

processing means for processing signals received from the light receiving section to perform the ophthalmic measurement; and

arranging means for arranging an alignment index at a position that is conjugate with the measurement mask so that during alignment an image of the alignment index appears superimposed on an image of the measurement zone formed at the aperture of the measurement mask;

wherein during alignment the measurement zone is scanned at high speed by the laser beam having the same scanning width as the scanning width used during measurement.

5,184,158

GATE FOR MOTION PICTURE CAMERA

Claus Grosser, Freising, Fed. Rep. of Germany, assignor to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG, Munich, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 692,224

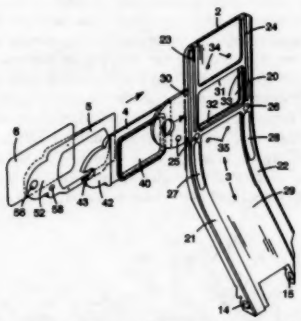
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1990, 4013909

Int. Cl.[5] G03B *1/48*

U.S. Cl. 352—226 **10 Claims**

1. A motion picture camera comprising film transport mechanism, film guide structure through which a motion picture film is moved by said film transport mechanism, and film guide structure having a film guide window and a sliding surface along which said motion picture film is moved by said film transport mechanism past said film guide window, and gate structure for disposition in said film guide structure, said gate structure comprising framelike film format mask structure that

defines a frame window smaller than said film guide window, the frame of said film format mask being depressed relative to said sliding surface of said film guide structure to provide a lint trap region, said film guide structure including guide means for receiving said film format mask structure with said frame window in alignment with said guide window, said guide means including a slot on one side wall of said film guide



structure, upper and lower guide channels extending transversely to the film path and a groove disposed opposite to said slot in the side wall of said film guide structure and extending parallel to the film path, said film format mask structure having a gripping tab which projects laterally out of said slot when the film format mask structure has been inserted in said guide means, and a support shoulder on said tab that is adapted to abut said side wall of said film guide structure.

5,184,159

LIGHT SOURCE APPARATUS FOR ENDOSCOPE

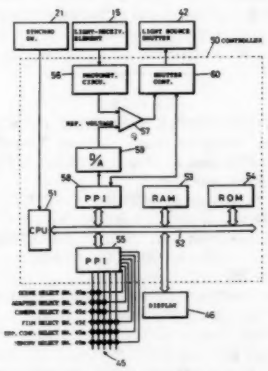
Katsuhiko Furuya, and Tadashi Takahashi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1990, Ser. No. 553,600

Claims priority, application Japan, Jul. 25, 1989, 1-193685; Aug. 21, 1989, 1-215659

Int. Cl.[5] G03B *29/00*

U.S. Cl. 354—62 **7 Claims**



7. A light source apparatus for an endoscope, which has a light source for supplying light for illuminating an object to the endoscope that is equipped with a photographing device, comprising:

a read only memory that stores data which is required to determine a quantity of exposure light applied to a photographic plane in said photographing device, said read only memory being interchangeably provided;

a reader than reads said data from said read only memory; and

an exposure controller that controls said exposure light quantity using said data which is read by said reader.

5,184,160

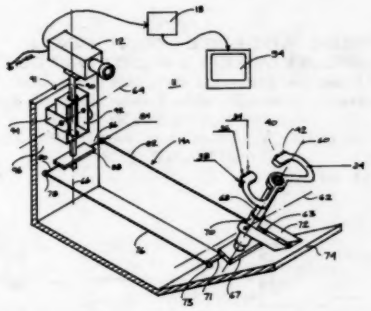
CAMERA POSITION ADJUSTMENT DEVICE

Yefim Massarsky, Newton, Mass., assignor to Foto Fantasy, Inc., Newton, Mass.

Filed Mar. 20, 1991, Ser. No. 672,369

Int. Cl.[5] G03B *15/06*

U.S. Cl. 354—76 **15 Claims**



1. A mechanical camera position adjustment device for allowing a user to adjust the relative position of a photography-booth camera to altar the position of the user's image, comprising:

a camera mounting including means for pivoting said camera on a vertical axis to provide horizontal field of view adjustment;

a remote camera adjustment mechanism operable by the user to move the camera; and

a mechanical linkage between said adjustment mechanism and said camera mount for directly translating user adjustment mechanism operation into camera movement to allow the user to directly control the camera position.

5,184,161

CAMERA WITH MAGNETIC RECORDING DEVICE

Akira Egawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1991, Ser. No. 756,316

Claims priority, application Japan, Sep. 7, 1990, 2-235586; Sep. 7, 1990, 2-235587; Sep. 7, 1990, 2-235588; Sep. 7, 1990, 2-235590; Sep. 7, 1990, 2-235591; Apr. 1, 1991, 3-068473; Jul. 31, 1991, 3-192029

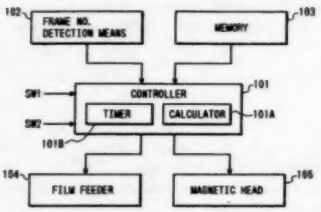
Int. Cl.[5] G03B *17/24*

U.S. Cl. 354—105 **27 Claims**

26. A recording device for use in a camera capable of recording information on a film in the course of feeding thereof after the phototaking operation of each frame, or a camera provided with said recording device, comprising:

a) a recording member for recording information on the film;

b) a first detection circuit for detecting information of the film feeding speed at the feeding of a frame; and



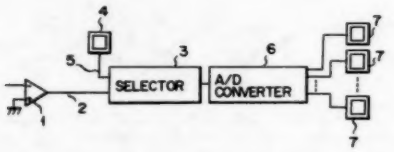
c) a control circuit for controlling the recording operation by said recording member at a next frame feeding, based on the information detected by said first detection circuit.

5,184,162

TESTING INTEGRATED CIRCUIT USING AN A/D CONVERTER BUILT IN A SEMICONDUCTOR CHIP

Kouji Saitoh, and Kazuyuki Uchida, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 20, 1991, Ser. No. 747,333
Claims priority, application Japan, Aug. 21, 1990, 2-219621
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R **7 Claims**



1. A testing integrated circuit comprising:

selecting means, provided in an integrated circuit of a semiconductor chip, for selecting one of a first signal supplied from an external portion of said semiconductor chip and a second signal used for measuring voltage at a predetermined portion in an internal circuit of said semiconductor chip, said first signal being converted from analog to digital during normal operation of said semiconductor chip;

an analog to digital converter provided in said integrated circuit, said analog to digital converter receiving an analog signal output from said selecting means and producing a digital output; and

a plurality of output pads disposed in said semiconductor chip, said output pads transmitting said digital output from said analog to digital converter to said external portion, said output pads corresponding to a bit quantity of said analog to digital converter.

5,184,163

REMOTE TRIGGER METHOD AND APPARATUS FOR A CAMERA SHUTTER

Helmut Wagerer, Des Plaines, Ill., assignor to W. Haking Enterprises Limited, Hong Kong

Filed Aug. 5, 1991, Ser. No. 740,449
Int. Cl.[5] G03B *17/38*
U.S. Cl. 354—266 **3 Claims**

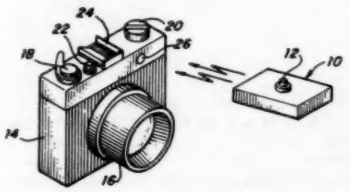
1. A remote control shutter release system for a camera, comprising:

a transmitter having a light emitting diode;

means associated with said transmitter for energizing said light emitting diode to cause said diode to emit a predetermined number of pulses or light at a predetermined pulse width, amplitude and repetition rate;

a shutter release within said camera; and

means for discriminating between ambient light and pulses from said light emitting diode associated with said camera, said discriminating means including means for receiving said pulses, said receiving means including means responsive to said pulses for operating said shutter release upon the receipt of pulses exceeding a predetermined amplitude and having said predetermined pulse width and repetition rate, said receiving means including means including a light responsive diode for proving an electrical signal in response to received light pulses, means including a high pass filter coupled to said diode for receiving the electrical signal from said diode and attenuating components of the electrical signal resulting from ambient light to provide a filtered signal, means including an analog threshold comparator electrically coupled to said filter for receiving said filtered signal and providing an output pulse signal only if



the filtered signal exceeds a predetermined amplitude determined by said analog threshold comparator, and means including a microprocessor coupled to said analog threshold comparator for receiving said output signal and determining the pulse width and repetition rate thereof and generating a shutter release signal only if the output pulse signal has a predetermined pulse width and a predetermined repetition rate;

said diode energizing means including an oscillator having a frequency of oscillation that determines said predetermined repetition rate, and a pulse generator responsive to said oscillator for generating pulses having a predetermined pulse width at a repetition rate determined by said frequency of oscillation; and

said transmitter including means for initiating operation of said oscillator, said initiating mean including manually operable means and means including timing means responsive to said manually operable means for operating said oscillator for a predetermined time interval.

5,184,164

PHOTOSENSITIVE MATERIAL PROCESSOR

Junichi Kose; Akira Sugiyama; Minoru Yamada, and Ryoei Nozaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 30, 1991, Ser. No. 707,553
Claims priority, application Japan, Jun. 1, 1990, 2-143554; Jun. 1, 1990, 2-143560; Dec. 10, 1990, 2-400286[U]
Int. Cl.[5] G03D *13/00, 3/02*
U.S. Cl. 354—298 **26 Claims**

1. A photosensitive material processor having a processing tank for processing a photosensitive material, comprising:

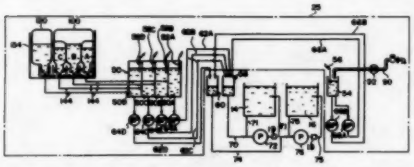
a circulating system having a circulating pipeline and a circulating pump disposed in said circulating pipeline and adapted to circulate a liquid in said processing tank through said circulating pipeline by the operation of said circulating pump;

a mixing tank for preparing a processing solution by mixing a stock solution and a dilution liquid;

a stock solution supplying pump for supplying the stock solution to said mixing tank;

a dilution liquid supplying pump for supplying the dilution liquid to said mixing tank;

a supply pipeline for connecting said mixing tank and a portion of said circulating pipeline upstream of said circulating pump so that the processing solution prepared in said mixing tank is supplied to said processing tank; and



control means for controlling said stock solution supplying pump and said dilution liquid supplying pump so that a ratio of periods of discharge of the liquids becomes a predetermined ratio, and for operating said circulating pump after the stock solution and the dilution liquid are supplied to said mixing tank by predetermined amounts.

5,184,165

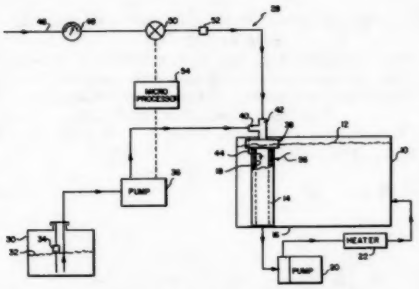
PROCESSOR WITH AUTOMATIC CHEMICAL DILUTION AND MIXING SYSTEM

Raymond G. Hauss, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 7, 1991, Ser. No. 711,837

Int. Cl.[5] G03D *3/02*

U.S. Cl. 354—324 **3 Claims**



1. In a processor for photographic film or paper, the processor having a tank for holding a processing solution, a filter at least partially located within the tank, and means for removing processing solution from the tank through the filter and returning the processing solution to the tank, an improved system for replenishing the processing solution comprising:

a storage container for holding a concentrated replenishment solution,

means for delivering to the processing solution adjacent the filter a quantity of the concentrated replenishment solution so that the concentrated replenishment solution is drawn directly into the filter, and

means for providing to the processing solution adjacent the filter a quantity of water sufficient so that the quantity of water is drawn directly into the filter to dilute the concentrated solution.

5,184,166

SELF-PHOTOGRAPHING METHOD FOR CAMERAS

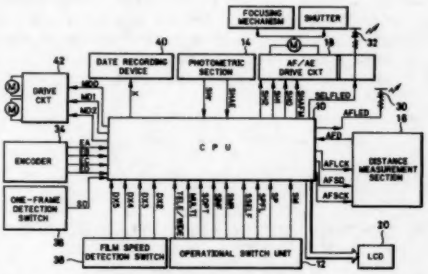
Michihiro Shiina; Yasuhiko Tanaka; Fumio Iwai; Yukio Noguchi; Takao Umetsu; Tatsuo Saito; Haruo Onozuka; Muneyoshi Saitoh, and Takao Koda, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1990, Ser. No. 634,831

Claims priority, application Japan, Dec. 28, 1989, 1-342460; Jan. 9, 1990, 2-2367; Jan. 18, 1990, 2-8857; Jan. 18, 1990, 2-8858; Jan. 18, 1990, 2-8859; Jan. 18, 1990, 2-8860; Jan. 30, 1990, 2-19986

Int. Cl.[5] G03B *13/36*

U.S. Cl. 354—400 **44 Claims**



1. A self-photographing method for a camera with a self-photographing mode, comprising the steps of:

setting a self-photographing mode in the camera;

actuating a switch means on the camera thereby to start a self-photographing operation of the camera;

measuring a subject distance at the beginning of said operation;

storing in the camera a first distance datum corresponding to said subject distance;

detecting second distance data of the same subject point as for the first distance datum at periodic intervals after storing said first distance datum;

comparing said first and second distance data to determine whether said distance data differ from each other;

executing an exposure operation of film in the camera when said first and second distance data differ from each other;

wherein said self-photographing mode is terminated before said predetermined exposure operation when said second distance data have been equal to said first distance datum throughout a predetermined time interval.

5,184,167

DISTANCE METERING DEVICE OF A CAMERA

Yoshikazu Iida, Chigasaki; Toru Kosaka, Zama; Hiroyuki Tsuru, Tokyo; Riichi Higaki, Kawasaki, and Akira Katayama, Koganei, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 20, 1991, Ser. No. 810,826

Int. Cl.[5] G03B *3/00*

U.S. Cl. 354—403 **2 Claims**

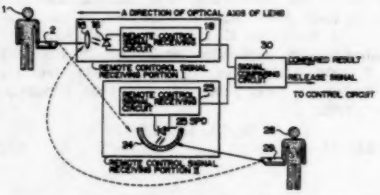
1. A distance metering device of a camera comprising:

multi-point distance metering means having a multi-point distance metering mode for metering distances to a plurality of points in a photographing field and a one-point distance metering mode for metering a distance to only one point;

first remote control signal receiving means having a directivity to the photographing field, for receiving a signal transmitted from a remote control transmitter;

second remote control signal receiving means having a receiving sensitivity to a remote control transmitter located outside of the photographing field;

remote control signal receiver selection means for selecting one of said first and second remote control singal receiving means; and



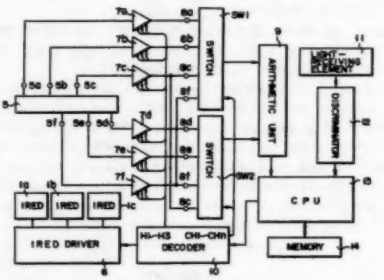
control means for forcibly switching the distance metering mode of said multi-point distance metering means to the multi-point distance metering mode when said first remote control signal receiving means is selected by said remote control signal receiver selection means.

5,184,168

DISTANCE MEASURING APPARATUS FOR CAMERA, WHICH CONTROLS OUTPUTS FROM MULTI-ELECTRODES PSD

Osamu Nonaka, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1991, Ser. No. 757,970
Claims priority, application Japan, Sep. 26, 1990, 2-257908; Jul. 31, 1991, 3-216123
Int. Cl.[5] G03B *13/36*; G01C *3/08*
U.S. Cl. 354—403 **15 Claims**



6. An active multi-point distance measuring apparatus comprising:

a light-emitting element array including a plurality of light-emitting elements for emitting distance measuring light to a plurality of points within a photographic frame;

a single optical position detection element having a longitudinal direction aligned with that of said light-emitting element array and arranged such that incident light moving ranges for the distance measuring light reflected by an object to be photographed are set to overlap each other, the incident light moving ranges being changed in accordance with an object distance,

said optical position detection element being provided with a plurality of electrodes at ends of each of said moving ranges and being arranged to output a signal current representing a light-receiving position of the reflected light through a corresponding one of said electrodes; and

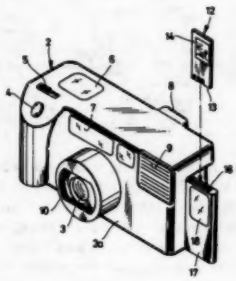
a distance arithmetic unit for calculating a distance to each object by using the signal current.

5,184,169

PHOTOGRAPHY MODE INPUT SYSTEMS

Yasuhiro Nishitani, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1991, Ser. No. 687,615
Claims priority, application Japan, Apr. 19, 1990, 2-103447
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—412 **17 Claims**



1. A photography mode input system for inputting an optional photography mode into a camera having a microcomputer for controlling exposure, comprising:

a card member having a signal element pattern corresponding to a predetermined optional photography mode, said card member being provided with graphic information indicating a corresponding photography mode; and

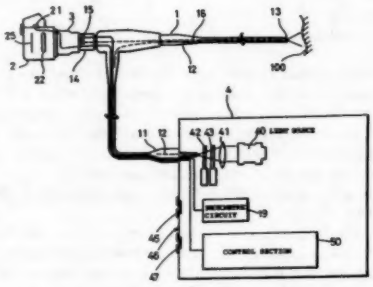
detecting means for detecting said signal element pattern, said detecting means being disposed on said camera and connected t said microcomputer, wherein said detecting means detect the presence or absence of signal elements constituting said signal element pattern, said signal elements occupying different respective predetermined positions on said card member.

5,184,170

PHOTOGRAPHING LIGHT QUANTITY CONTROLLER FOR ENDOSCOPE

Tadashi Takahashi; Katsuhiko Furuya; Masaaki Nakasima, and Takayuki Enomoto, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1990, Ser. No. 596,382
Claims priority, application Japan, Oct. 16, 1989, 1-270083; Feb. 14, 1990, 2-33216; Jul. 26, 1990, 2-20055
Int. Cl.[5] G03B *7/00*
U.S. Cl. 354—413 **18 Claims**



1. A photographing light quantity controller for an endoscope, which is used to control the quantity of illuminating light when a photograph is to be taken through said endoscope, said controller comprising:

a light source for supplying light, for illuminating an object to said endoscope;

means for initiating and synchronizing a photographing operation;

detecting means for detecting an illuminating condition in an observation state before a photographing operation is initiated and synchronized by said means for initiating; and

control means for charging the brightness of illuminating light that is supplied from said light source to said endoscope during the photographing operation on the basis of a signal that is detected by said means for detecting an illuminating condition in the observation state.

5,184,171

ELECTRONIC FLASH DEVICE

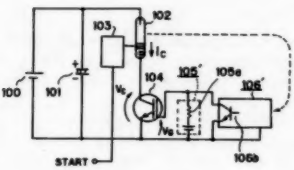
Akio Uenishi, Fukuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1991, Ser. No. 644,562

Claims priority, application Japan, Feb. 5, 1990, 2-26821

Int. Cl.[5] G03B *15/05*; H05B *41/00*

U.S. Cl. 354—416 **11 Claims**



1. An electronic flash device, comprising:

first power supply means;

a main condenser charged by said first power supply means;

a discharge tube for flashing by consuming electric energy charged in said main condenser;

a trigger circuit for triggering said discharge tube in response to a flash start instruction;

an insulated gate type semiconductor switching device having main electrodes connected in series with said main condenser and said discharge tube to form a discharge loop;

second power supply means for supplying gate voltage sufficient to turn on said insulated gate type semiconductor switching device, to the gate of said insulated gate type semiconductor switching device throughout waiting and flashing states of said insulated gate type semiconductor switching device; and

a flash stop circuit for stopping flashing of said discharge tube by changing said gate voltage, in order to make said insulation gate type semiconductor switching device shift to an OFF state by predetermined time width, after predetermined time elapses from start of flashing of said discharge tube.

5,184,172

METHOD OF AND APPARATUS FOR AUTOMATICALLY CONTROLLING EXPOSURE

Akihiko Miyazaki, Tokyo, Japan, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Oct. 2, 1991, Ser. No. 771,386

Claims priority, application Japan, Nov. 28, 1990, 2-327413

Int. Cl.[5] G03B *7/08, 7/095*; H04N *5/238*; G01J *1/42*

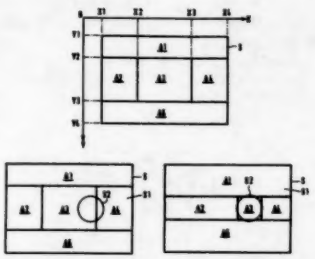
U.S. Cl. 354—432 **8 Claims**

1. A method of automatically controlling opening of an iris based principally on luminance of an image in a specific zone within a picturing area characterized by the steps of:

dividing the picturing area into a specific zone and a plurality of zones adjacent to said specific zone;

calculating an average luminance of each image in said specific and adjacent zones;

with respect to each combination of said specific zone with a respective one of said plurality of zones, calculating a difference in average luminance between the two zones,



moving a boundary between the specific zone and the adjacent zone towards this adjacent zone when said difference is not greater than a specific value, and moving said boundary away from said adjacent zone when said difference is greater than said specific value; and

applying a maximum weight to the average luminance in said specific zone and controlling the iris based principally on this weighted average luminance.

5,184,173

PROTECTING APPARATUS OF DISPLAYING PORTION OF PHOTOGRAPHING DATA IN CAMERA

Tadayuki Kirigaya, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

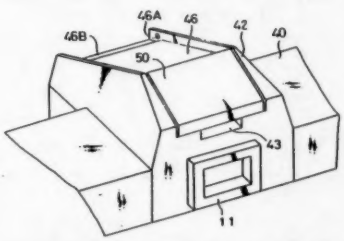
Continuation of Ser. No. 444,809, Dec. 1, 1989, abandoned, which is a continuation of Ser. No. 172,212, Mar. 23, 1988, Pat. No. 4,903,062. This application Oct. 21, 1991, Ser. No. 779,158

Claims priority, application Japan, Mar. 26, 1987, 62-44832

The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.

Int. Cl.[5] C03B *17/18*

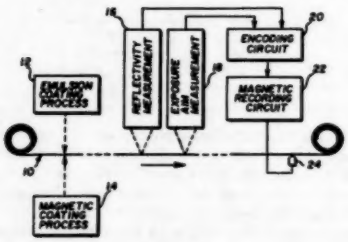
U.S. Cl. 354—471 **21 Claims**



1. An apparatus for protecting a photographic data display portion of a camera body, said apparatus comprising a protective cover for protecting said photographic data display portion, said protective cover being movable between a closed position in which said photographic data display portion is directly covered and closed by said protective cover and an open position in which said photographic data display portion is uncovered by said protective cover, said camera body comprising a housing with said photographic data display portion being positioned in said housing, wherein said protective cover is rotatably held on said housing, and, in said covered postion, forms a portion of the exterior of said camera body, and connection/disconnection means for connecting said photographic data display portion to a source of power in association

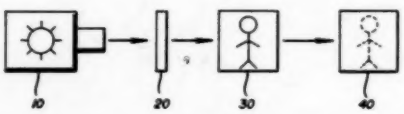
with movement of said protective cover to said open position and disconnecting said photographic data display portion from the source of power in association with movement of said protective cover to said closed postion.

5,184,174
PHOTOGRAPHIC SYSTEM WITH OFF-THE-FILM EXPOSURE METERING
Cynthia S. Bell, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 19, 1991, Ser. No. 794,290
Int. Cl.[5] G03B 7/099, 7/24; G03C 5/00
U.S. Cl. 354—480 6 Claims



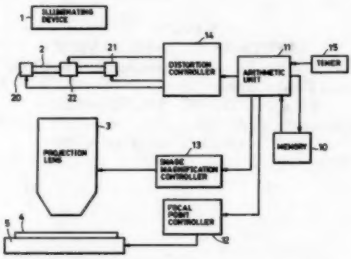
3. An elongate photographic film strip comprising:
a magnetic recording area; and
at least one field recorded on said magnetic area, said field including encoded data representing a surface reflectivity adjusted film exposure constant measured for said film strip at the time of film production.

5,184,175
SYSTEM AND METHOD FOR REPRODUCING AN IMAGE
Mary L. Schmoeger; Charles P. Hagmaier, Jr., both of Rochester; Mitchell J. Bogdanowicz, Spencerport; Christopher L. DuMont, and Richard C. Sehlin, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 718,685, Jun. 21, 1991, Pat. No. 5,122,769. This application Feb. 13, 1992, Ser. No. 835,564
Int. Cl.[5] G03B 27/32, 27/52, 27/72
U.S. Cl. 355—32 11 Claims



1. A system for reproducing an original color record on a light sensitive material, the system comprising:
(a) a color record having two or more sub-records with wavelength peaks in different regions of the electromagnetic spectrum;
(b) an additive wavelength light source;
(c) a light sensitive material onto which the color record can be illuminated by means of the light source; and
(d) selective filtration means between the light source and the light sensitive material; wherein the selective filtration means modifies the contrast of the reproduction by means of off-peak energy filtration, without modifying color balance of the reproduction or the wavelength peaks of each of the sub-records.

5,184,176
PROJECTION EXPOSURE APPARATUS WITH AN ABERRATION COMPENSATION DEVICE OF A PROJECTION LENS
Yasuyuki Unno, Hadano; Seiji Orii, and Masami Yonekawa, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 1, 1991, Ser. No. 769,445
Claims priority, application Japan, Oct. 8, 1990, 2-268346; Dec. 12, 1990, 2-409879
Int. Cl.[5] G03B 27/68, 27/42
U.S. Cl. 355—52 11 Claims

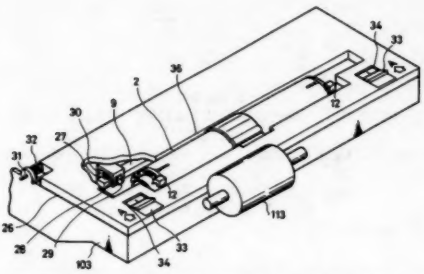


1. A projection exposure apparatus in which a pattern formed on an original is imaged onto a substrate at a predetermined magnification to form a pattern image on the substrate, said apparatus comprising:
first support means for supporting the original;
second support means for supporting the substrate;
a projection lens disposed between said first and second support means for imaging the pattern onto the substrate;
deforming means for deforming the original in its surface direction;
arithmetic means for calculating a deviation between an original geometric shape of the pattern formed on the original and a geometric shape of the pattern image formed on the substrate; and
control means for controlling said deforming means bases on the deviation calculated by said arithmetic means so that the geometric shape of the pattern image coincides with the original geometric shape of the pattern.

5,184,177
ELECTROPHOTOGRAPHIC PRINTING APPARATUS
Hiroshi Kikuchi; Shigeki Nakajima; Hisao Ono, and Yoshiharu Momiyama, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan
Filed Jan. 31, 1991, Ser. No. 648,208
Claims priority, application Japan, Feb. 6, 1990, 2-25159
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—200 6 Claims

3. An electrophotographic printing apparatus, comprising:
a main body, said main body including a plurality of paper transporting rollers;
a frame mounted in the main body of said apparatus and having an opening which faces upward;
an operable lid mounted on said frame, covering said opening, and having a window;
an image-forming cartridge removably mounted to said main body, said image-forming cartridge including a photosensitive drum having a photoconductive layer on its surface, and means for supplying developing agent to the photosensitive drum wherein said image-forming cartridge

being mountable to said frame and removable from said frame only when said lid is opened; and



a developing agent tank removable mounted to said image forming cartridge and removable through said window when said lid is closed.

5,184,178

IMAGE RECORDING APPARATUS HAVING AN INTERCHANGEABLE CARTRIDGE

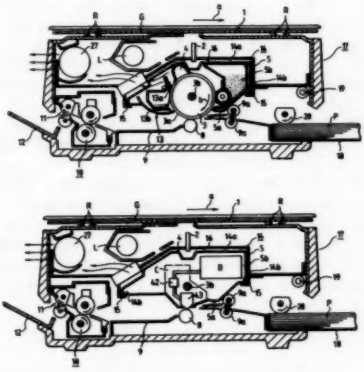
Yoshiaki Takayanagi, and Hiromitsu Hirabayashi, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 404,851, Sep. 8, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 771,866

Claims priority, application Japan, Sep. 13, 1988, 63-229567; Sep. 13, 1988, 63-229568

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—202 **17 Claims**



1. An image recording apparatus comprising:

a first cartridge detachably mountable in a holding portion of said apparatus and provided with recording means for recording an image on a sheet by an electrophotographic process;

guide means for loading or detaching said first cartridge or a second cartridge;

a second cartridge loadable in the holding portion of said apparatus in place for said first cartridge and provided with a thermal head for recording an image on a sheet;

roller means for transferring an image formed on a photosensitive member to the sheet when said first cartridge is loaded,

wherein said roller means is used as a platen for pushing out the sheet in the direction of the thermal head when said second cartridge is loaded.

5,184,179

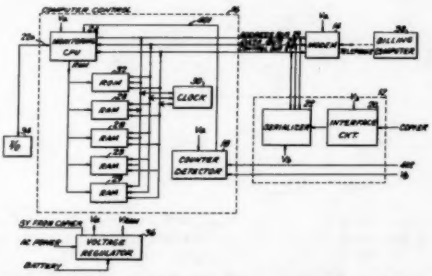
PHOTOCOPY MONITORING SYSTEM AND METHOD FOR MONITORING COPIERS

Leonard Tarr, Woodbury, N.Y.; Gregory King, Andover, and Brian Johansen, Bricktown, both of N.J., assignors to Monitel Products Corp., Cedar Knolls, N.J.

Continuation-in-part of Ser. No. 341,018, Apr. 20, 1989, which is a continuation-in-part of Ser. No. 194,710, May 17, 1988, abandoned. This application Jul. 31, 1991, Ser. No. 739,060

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—206 **11 Claims**



1. A system for monitoring a paper processing device and reporting to a central station, the paper processing device including an internal diagnosing system for diagnosing malfunctions within the system, a display device for displaying the diagnosed malfunction, the diagnosing system providing an internal diagnostic signal specific to the paper processing device for causing the display device to display the malfunction comprising:

counter means for counting the number of papers processed by the paper processing device and producing a count signal corresponding to each paper processed;

first control means for receiving the count signal, totalling the count signal and transmitting the total count at at least one of a predetermined time interval and a predetermined count interval and producing a count trigger signal;

interface means for receiving the diagnostic signal without interfering with the operation of the display device, the first control means also receiving the diagnostic signal from the interface means and in response thereto producing a diagnostic trigger signal;

modem means for transmitting the total count signal to the central station upon receipt of said count trigger signal, the modem means also receiving the diagnostic trigger signal and transmitting the diagnostic signal in response thereto to the central station; and

voltage regulator means receiving an AC power input, a power input from the paper processing device and a battery power input, said voltage regulator means providing power to said first control means utilizing said battery power when said voltage regulator means detects an absence of an input of AC power and power from said paper processing device.

5,184,180

METHOD FOR SUPPLYING POWER TO A COPYING MACHINE

Hoon B. Choi, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 12, 1991, Ser. No. 712,892

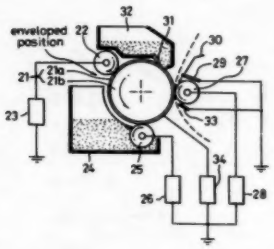
Claims priority, application Rep. of Korea, Jun. 18, 1990, 8907/1990

Int. Cl.[5] G03G *15/02*

U.S. Cl. 355—219 **13 Claims**

1. A method for supplying power to a copying machine comprising the steps of:

generating a uniform potential on a surface of a photosensitive drum through an electrifier;
changing the potential in a predetermined portion through an enveloper to form a latent image;
attracting toner from a developer having a developer roller on said photosensitive drum corresponding to the latent image;
transcribing by a transcriber the attracted toner on paper supplied through a guide;



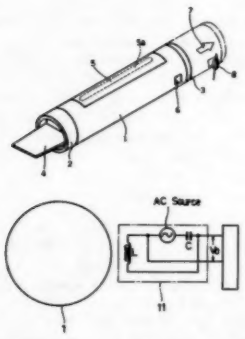
discharging by a discharging brush a charge generated on the paper supporting a transcribed image, said guide and said discharging brush being grounded;
supplying a predetermined DC voltage to said developer roller, electrifier and transcriber; and
supplying a symmetric AC voltage to said photosensitive drum concurrently with the supplying of said predetermined DC voltage to said developer roller, wherein said predetermined DC voltage supplying step and said symmetric AC voltage supplying step generate an asymmetric AC power on the surface of said photosensitive drum.

5,184,181

CARTRIDGE DISCRIMINATING SYSTEM

Shigeo Kurando; Yoshinori Makiura; Yutaka Shigemura; Junichi Ooura; Eiji Mifune, all of Osaka; Tatsuo Imafuku, Kagoshima; Hiroshi Komata, Hyogo, and Mikio Ido, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 99,118, Sep. 21, 1987, Pat. No. 4,963,939. This application Aug. 2, 1990, Ser. No. 561,910
Claims priority, application Japan, Sep. 24, 1986, 61-226383; Sep. 27, 1986, 61-228869; Sep. 27, 1986, 61-228870; Sep. 27, 1986, 61-228871; Sep. 30, 1986, 61-234104
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—260 **1 Claim**



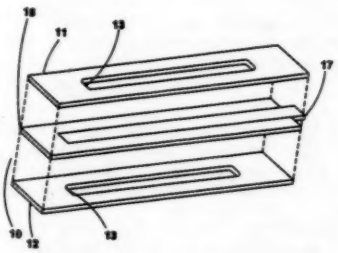
1. A developer housing cartridge equipped with a hollow container for housing a developer and a cartridge indicating means for indicating the type or position of the cartridge, which is installed on an outer surface of the hollow container and wherein said cartridge indicating means is a small separate container housing toner and/or carrier of a same type as that of the developer housed in the cartridge.

5,184,182

COPIER AND PRINTER TONER HOPPER SEALING DEVICE

Steven B. Michlin, 5310 Bentley Suite 105, West Bloomfield, Mich. 48322

Filed Mar. 4, 1992, Ser. No. 845,722
Int. Cl.[5] G03G *15/06, 21/00*
U.S. Cl. 355—260 **19 Claims**



1. A sealing means for sealing a toner hopper used in printer or copying machine toner cartridges, in order that used toner cartridges can be refilled with toner, sealed, and transported with little possibility of spilling any of the toner from the toner hopper, said toner hopper having an opening through which toner flows, said sealing means comprising a seal-insert and slide-seal, wherein said seal-insert comprises separate pieces fastened into one component by a joining means such that there are outer pieces and a middle piece sandwiched between said outer pieces, said outer pieces having corresponding slots and said middle piece having a slot wider than said slots in said outer pieces and being open at one end, said slots in said outer and middle pieces being aligned such that a passage is formed through said seal-insert, said slide-seal comprising a strip of material that may be slid through the open end of said slot in said middle piece, blocking said passage in said seal-insert, so that when said seal-insert is attached to the toner hopper over said toner hopper opening, said slide-seal would provide a reusable seal blocking or allowing toner flow through said toner hopper opening and through said seal-insert passage.

5,184,183

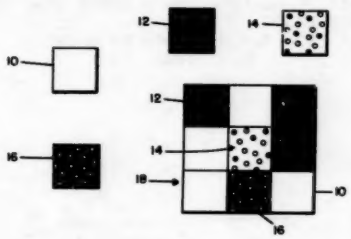
APPARATUS FOR PRINTING GREY SCALE IMAGES

John P. Karidis, Ossining, N.Y.; Timothy C. Reiley, Los Gatos, and Lawrence B. Schein, San Jose, both of Calif., assignors to International Business Machines, Corporation, Armonk, N.Y.

Division of Ser. No. 594,513, Oct. 9, 1990, Pat. No. 5,142,337. This application Jan. 22, 1992, Ser. No. 824,109
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—266 **3 Claims**

1. In combination with an electrophotographic printing system in which two distinct toners are developed, a first toner being an opaque first color for application by said printing system onto a defined region of a receiving surface and a second toner being composed of a mixture of said opaque first

color and of an opaque second color and clear, which allows the printing of less than fully-dark pixels, for application by



said printing system onto the defined region so as to overlie said first toner thereby allowing intermediate grey-scale levels.

5,184,184

IMAGE FORMING APPARATUS

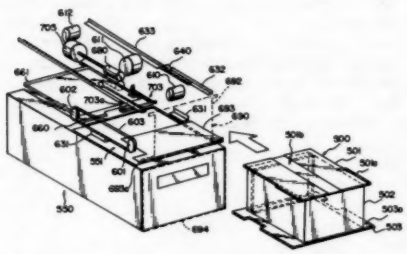
Keisuke Hayashi, Fujisawa; Kouji Ishigaki, Yokohama; Kazuyuki Nakahara; Masato Yanagida, both of Tokyo, and Fumio Kishi, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 14, 1992, Ser. No. 835,579

Claims priority, application Japan, Feb. 17, 1991, 3-045885

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—296 **20 Claims**



1. An image forming apparatus comprising:

a body;

an image carrier;

developing means for developing a latent image electrostatically formed on said image carrier by a developer;

cleaning means for collecting the developer remaining on said image carrier after image transfer;

waste developer storing means for storing the developer collected by said cleaning means;

developer storing means for storing a fresh supplementary toner;

a loading section to be loaded with said developer storing means;

a developer supply section to be supplied with the supplementary developer from said developer storing means;

first transporting means for transporting said developer storing means from said loading section to said developer supply section;

collecting means for collecting empty developer storing means which has supplied the developer to said developer supply section; and

second transporting means for transporting said empty developer storing means from said developer supply section to said collecting means;

at least one of said collecting means and said waste developer storing means being removably mounted on said body.

5,184,185

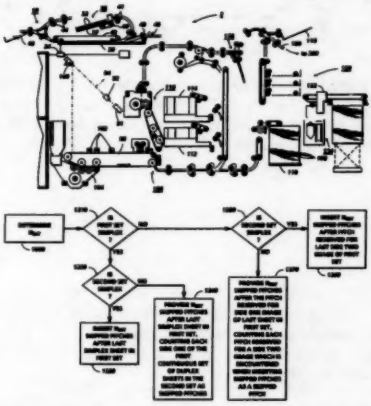
METHOD FOR DUPLEX PRINTING SCHEDULING SYSTEM COMBINING FINISHER INTERSET SKIPPED PITCHES WITH DUPLEX SHEET SCHEDULING

David L. Rasmussen; Michael E. Farrell, both of Fairport, and Pedro R. Ortiz, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1991, Ser. No. 752,123

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—308 **10 Claims**



1. A method of scheduling a plurality of sets of copy sheets for being printed selectively on one or both sides and with an interset interval of pitches being provided between each consecutive set of copy sheets, at least some of the copy sheets in a second one of two adjacent sets of copy sheets being printed on both sides, said method comprising the steps of:

a) determining the interset interval, N_{INT}, of pitches required between said two adjacent sets of copy sheets;

b) determining a minimum number of skipped pitches, N_{SKIP}, required to be inserted between said two adjacent sets of copy sheets to proVide said determined interset interval; and

c) inserting said minimum number of skipped pitches, N_{SKIP}, between said two adjacent sets of copy sheets.

5,184,186

MOTOR CONTROL FOR AN AUTOMATIC DOCUMENT CONVEYING APPARATUS

Yasuhiko Kida, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Sep. 30, 1991, Ser. No. 767,638

Claims priority, application Japan, Sep. 29, 1990, 2-261870

Int. Cl.[5] G03G *15/00 F*

U.S. Cl. 355—321 **2 Claims**

1. An automatic document conveying apparatus for use with an image forming apparatus, comprising:

means for temporarily storing a plurality of documents;

means for feeding the documents individually from the storing means;

first motor means for driving the feeding means;

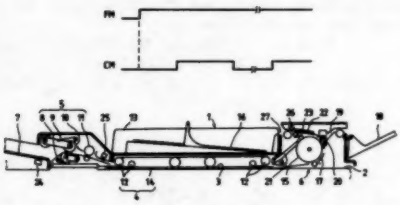
means for conveying the documents individually to a predetermined position of the image forming apparatus, the image forming apparatus forming an image of each of the documents at the predetermined position;

second motor means for driving the conveying means;

means for ejecting the documents individually from the automatic document conveying apparatus; and

means, responsive to signals from the image forming apparatus, for controlling the first motor means to continuously

operate to continuously drive the feeding means while operating the second motor means in predetermined on and off manner until the image forming apparatus has



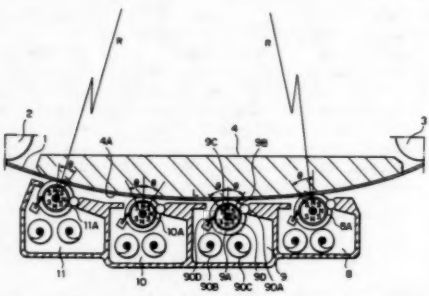
formed the image of said each of the documents stored in the storing means, said controlling means preventing the first motor means and the second motor means from being started simultaneously.

5,184,187

COLOR IMAGE FORMING APPARATUS

Satoshi Haneda; Shizuo Morita; Masakazu Fukuchi, and Shunji Matsuo, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 29, 1991, Ser. No. 737,177
Claims priority, application Japan, Aug. 7, 1990, 2-209050
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 **4 Claims**



1. A color image forming apparatus comprising:

(a) a belt type image carrier extending around two rollers;

(b) a guide between said two rollers on which said image carrier member is suitably conveyed, said guide having a convex curvature toward said image carrier, and

(c) a plurality of developers facing said image carrier serially along a path of movement of said image carrier, each of said development provided with a magnetic roll in which a first magnetic pole facing said image carrier most adjacently and another magnetic pole next to the first magnetic pole are disposed at a predetermined angle, satisfying the following formula:

$$L/R < \theta$$

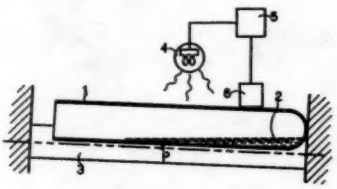
in which R is a radius of the curvature of said guide, L is a maximum length of said image carrier along its circumferential surface facing said plurality of developers and θ is said predetermined angle.

5,184,188

OPTICAL BLOOD HEMOSTATIC ANALYSIS APPARATUS AND METHOD

Brian S. Bull, Loma Linda, and Ralph A. Korpman, Redlands, both of Calif., assignors to Medical Devices Corporation, San Bernardino, Calif.

Filed Jan. 23, 1990, Ser. No. 468,594
Int. Cl.[5] G01N *33/48*
U.S. Cl. 356—39 **60 Claims**



1. An apparatus for optically measuring characteristics of a specimen fluid in a transparent container, the specimen fluid including whole blood, diluent, and disclosure reagent, the apparatus including:

a. means for agitating the specimen fluid in the transparent container, such that a substantial portion of the interior surface of the container is coated with a layer of the fluid;

b. means for directing a light beam through the layer of coating fluid of at least one coated surface of the container;

c. means for detecting a change in the light beam after the light traverses the at least one coated surface of the container;

d. means, coupled to the detecting means, for discriminating discrete clumps of material sticking to the surface of the container from the coating of fluid on the container surface, such discrete clumps of material being representative of a characteristic of the specimen fluid.

5,184,189

NON-INTRUSIVE BEAM POWER MONITOR FOR HIGH POWER PULSED OR CONTINUOUS WAVE LASERS

Robert A. Hawsey, and Matthew B. Scudiere, both of Oak Ridge, Tenn., assignors to The United States of Americas as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 412,713, Sep. 26, 1989, abandoned. This application May 29, 1991, Ser. No. 706,831
Int. Cl.[5] G01J *1/42*; H01S *3/13*
U.S. Cl. 356—218 **10 Claims**

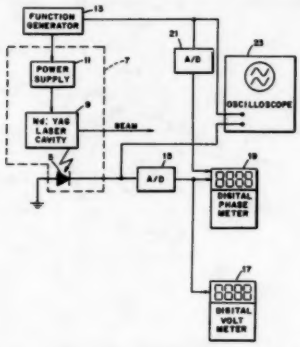
1. A system for monitoring parameters of an output beam of a laser, comprising:

a. a laser beam generating device including a lasing medium from which an output laser beam is generated along a beam path upon excitation and from which incoherent light is simultaneously emitted about said lasing medium upon said excitation of said lasing medium;

b. a light detecting means disposed out of the beam path of said laser beam generating device for viewing only said incoherent light emitted from about said lasing medium and generating an output signal proportional thereto; and

c. indicating means responsive to the output of said light

detecting means for indicating the output laser beam power level of said laser beam generating device in response to the amplitude of said output signal of said light detecting means.

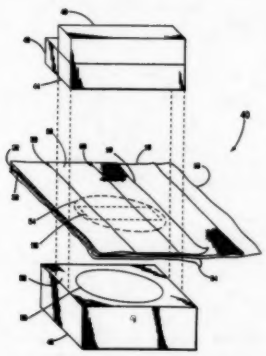


5,184,190

METHOD AND APPARATUS FOR DETECTING FLAWS AND DEFECTS IN HEAT SEALS

Kula R. Rai; Thomas M. Lew, and Robert B. Sinclair, all of San Antonio, Tex., assignors to Winzen International, Inc., San Antonio, Tex.

Filed May 28, 1991, Ser. No. 706,043
Int. Cl.[5] G01N *21/88, 21/89*
U.S. Cl. 356—239 **24 Claims**



1. A method for examining a heat seal formed between a plurality of translucent sheets to detect the presence of including flaws and defects, comprising the steps of:

transmitting electromagnetic radiation through a lateral section of the heat seal;

detecting the intensity of radiation transmitted through the lateral seal section;

generating a line profile for the lateral seal section, said line profile having a shape related to the integrity of the heat seal and an amplitude defined by changes in the detected radiation intensity across the lateral seal section;

processing the generated line profile to identify certain shape characteristics indicative of the integrity of the heat seal; and

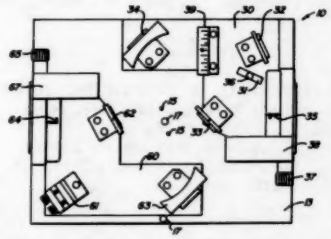
comparing the identified shape characteristics for the derived line profile with a predetermined line profile shape characteristic to detect the presence of a flaw or defect in the lateral seal section.

5,184,191

SAMPLE TABLE FOR MULTI-MODE SPECTRUM ANALYSIS

Krishnaswamy Krishnan, Norwell, Mass., assignor to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Mar. 20, 1991, Ser. No. 672,518
Int. Cl.[5] G01N *21/01*
U.S. Cl. 356—244 **4 Claims**



1. A sample holding apparatus for directing an incoming spectrometer beam, the apparatus comprising:

base means defining a first plane parallel to the incoming spectrometer beam;

a first platform pivotally mounted to the base means;

a beam input optical train mounted to the first platform for directing an input beam onto a sample;

sample holder means mounted on the base means for holding the sample in the path of the beam from the beam input means; and

a second platform pivotally mounted to the base means;

a beam output optical train mounted to the second platform for receiving the beam after it strikes the sample and for transmitting the resultant beam away from the sample for analysis;

wherein the beam input optical train directs the spectrometer beam directly at the beam output optical train when the first and second platforms are parallel to one another, and wherein the beam input means directs the spectrometer beam toward the base means such that the beam reflects off the sample and at the beam output optical train when the first and second platforms are not parallel to one another.

5,184,192

PHOTOMETRIC APPARATUS WITH A FLOW CELL COATED WITH AN AMORPHOUS FLUOROPOLYMER

Anthony C. Gilby, Foxborough, and William W. Carson, Hopkinton, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

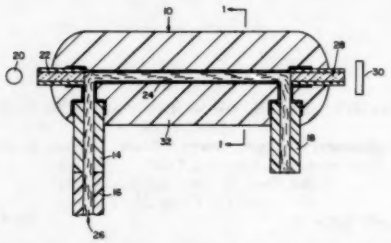
Filed Jul. 17, 1991, Ser. No. 731,677
Int. Cl.[5] G01N *21/05;* B29C *39/02*
U.S. Cl. 356—246 **7 Claims**

1. A flow cell for housing a liquid sample and for exposing a liquid sample to light which comprises

a conduit having a smooth inner wall formed of an amorphous fluoropolymer having a refractive index less than the refractive index of water,

said amorphous fluoropolymer having a thickness at least as

great as the wavelength of light such that when said conduit is filled with water, visible light and ultra-violet light



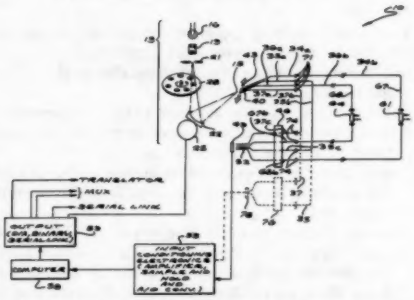
can be transmitted along the axis of said conduit by total internal reflection, substantially without loss.

5,184,193

DUAL FIBER OPTIC SPECTROPHOTOMETER

David A. LeFebre, El Dorado Hills, Calif., assignor to Guided Wave, El Dorado Hills, Calif.

Filed Jan. 4, 1989, Ser. No. 293,218
Int. Cl.[5] G01J *3/08, 3/42;* **G02B** *26/02*
U.S. Cl. 356—325 **51 Claims**



1. A low noise spectrophotometer, comprising:

monochromater means for providing a light beam of variable wavelength at an output;

a first single strand fiber optic waveguide for conducting light from said monochromater means toward a sample;

a second single strand fiber optic waveguide for conducting light; and

translation means for alternatively positioning input ends of said first and second single strand fiber optic waveguides at the same position in space with respect to the output of said monochromater means, wherein said first and second fiber optic waveguides alternatively conduct light from said monochromater means to provide compensation for time and wavelength dependent fluctuations in the light intensity at the output of said monochromater means.

5,184,194

CARRIER PARTICLE SCAVENGING DEVICE

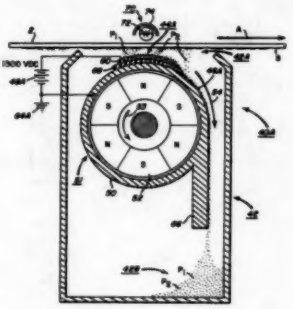
Michael Mosehauer; Catherine D. Newell, and Andrew J. Mauer, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1991, Ser. No. 783,488
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—297 **9 Claims**

1. A scavenging device for use in an electrostatographic reproduction machine to recapture charged carrier particles from a moving image-carrying surface, the scavenging device comprising:

(a) a first means including a plate member mounted on a non-magnetic shell and within a magnetic field of a magnetic roller core of said non-magnetic shell for capturing from an image-carrying surface charged carrier particles having a correct first polarity;

(b) a second means located downstream of said first means



relative to the direction of movement of the image-carrying surface for recapturing from such surface charged carrier particles having a wrong polarity opposite to said correct first polarity; and

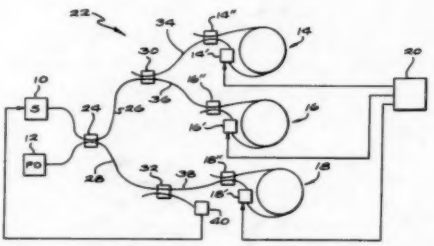
(c) transport means for moving the recaptured charged carrier particles away from the image-carrying surface.

5,184,195

TRIAXIAL FIBER OPTIC SAGNAC INTERFEROMETER WITH SINGLE SOURCE AND DETECTOR

Eric L. Goldner, Valencia, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed May 28, 1991, Ser. No. 705,762
Int. Cl.[5] G01C *19/72*
U.S. Cl. 356—350 **9 Claims**



1. A triaxial fiber optic Sagnac interferometer for measuring rotation rates about three axes comprising, in combination:

a) a source of optical energy;

b) a first, a second and a third gyroscope for measuring rotation rates about a first, a second and third axis respectively;

c) each of said gyroscopes comprising a coil of optical fiber;

d) means for launching said optical energy into each of said coils as counterpropagating waves;

e) phase modulators located in each of said coils for artificially modulating the phase difference between said counterpropagating waves;

f) a single detector for receiving the outputs of each of said gyroscopes;

g) an optical network for receiving the output of said source, distributing said output to said gyroscopes, receiving the output of said gyroscopes and transmitting said outputs to said single detector; and

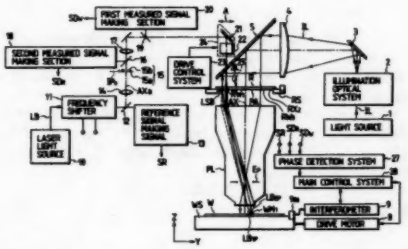
h) means for driving said phase modulators so that the outputs of said gyroscopes are distinguishable at said detector, said means including means for modulating said gyroscopes in accordance with three mutually out-of-phase modulation sequences, each of said modulation sequences comprising a measuring period and two blanking periods.

5,184,196

PROJECTION EXPOSURE APPARATUS

Masahiro Nakagawa; Hideo Mizutani, both of Yokohama; Kouichirou Komatsu, Tokyo, and Yawara Nojima, Chiba, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 19, 1991, Ser. No. 810,130
Claims priority, application Japan, Dec. 26, 1990, 2-406801
Int. Cl.[5] G01B *11/00*
U.S. Cl. 356—401 **7 Claims**



1. A projection exposure apparatus for projecting a predetermined pattern formed on a mask onto a photosensitive substrate, comprising;

a projection optical system for forming an image of the pattern on said substrate under exposure light having a first wavelength;

an illumination system for illuminating a mark on said photosensitive substrate with light having a second wavelength different from the first wavelength through said projection optical system so as to attain alignment; and said mark,

said illumination system comprising;

a light source for emitting the light having the second wavelength;

a first field stop for defining an illumination region on said photosensitive substrate said first field stop having at least two linear edges which extend in a direction substantially perpendicular to a sagittal direction in a visual field of said projection optical system and which are juxtaposed at a predetermined interval in the sagittal direction; and

a second field stop, for defining an illumination region on said photosensitive substrate, said second field stop having at least two linear edges which extend in a direction substantially perpendicular to a meridional direction in a visual field of said projection optical system and which are juxtaposed to be separated at a predetermined interval in the meridional direction: and

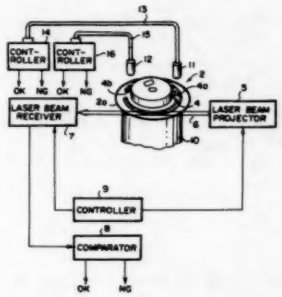
said first and second field stops being juxtaposed to be separated in an optical axis direction of said illumination system by a distance according to an astigmatism of said projection optical system caused by the light having the second wavelength, and said edges of said first and second field stops being focused on said photosensitive substrate through said projection optical system.

5,184,197

METHOD FOR INSPECTING MAGNETIC DISK CARTRIDGE

Tomohiro Nakata, and Akira Mizuta, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 31, 1991, Ser. No. 814,793
Claims priority, application Japan, Jan. 10, 1991, 3-001540
Int. Cl.[5] G01N *21/88*; G01B *11/28*
U.S. Cl. 356—426 **5 Claims**



1. A method for inspecting a magnetio disk cartridge, wherein the state, with which an adhesive agent has been applied as an annular layer onto a flange of a center hub in order to adhere a magnetic disk body and the flange of the center hub to each other, is inspected,

the method for inspecting a magnetic disk cartridge comprising the steps of:

i) irradiating a collimated light beam to a cross section of the layer of said adhesive agent, which cross section is taken in the radial direction of said center hub, from a direction which is parallel to the surface of said flange and which is perpendicular to said cross section of the layer of said adhesive agent, said collimated light beam having a beam diameter such that the whole cross section may be included in the beam diameter,

ii) detecting the amount of the collimated light beam, which has passed through the region in the vicinity of said flange,

iii) calculating the area of said cross section of the layer of said adhesive agent from the detected amount of the collimated light beam, which has passed through the region in the vicinity of said flange, and

iv) inspecting the amount of said adhesive agent, which has been applied onto said flange, from the results of the calculation.

5,184,198

SPECIAL GEOMETRY SCHOTTKY DIODE

Meir Bartur, Brentwood, Calif., assignor to Solid State Devices, Inc., La Mirada, Calif.

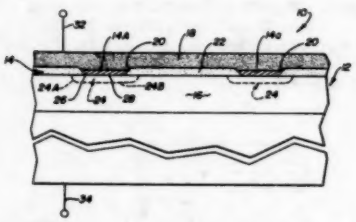
Continuation of Ser. No. 566,237, Aug. 15, 1990, abandoned.
This application Jun. 12, 1991, Ser. No. 714,341
Int. Cl.[5] H01L *29/48, 23/48*
U.S. Cl. 257—471 **13 Claims**

1. A Schottky barrier diode, comprising:

a substrate having a plurality of sides;

a Schottky metal contact layer in contact with a first side of the substrate to form said Schottky barrier diode, said Schottky metal contact layer comprising a plurality of individual Schottky contact regions;

a first conductor electrically coupled to each of the Schottky contact regions;



a second conductor electrically coupled to a second side of the substrate; and

wherein each Schottky contact region is circular-shaped.

5,184,199

SILICON CARBIDE SEMICONDUCTOR DEVICE

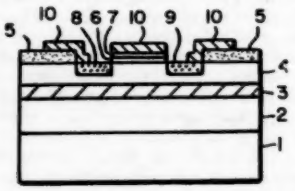
Yoshihisa Fujii; Akira Suzuki, both of Nara; Katsuki Furukawa, Sakai, and Mitsuhiro Shigeta, Kyoto, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 5, 1990, Ser. No. 533,573

Claims priority, application Japan, Jun. 7, 1989, 1-145617

Int. Cl.[5] H01L *29/10, 29/78, 27/01, 27/04*

U.S. Cl. 257—77 **7 Claims**



1. A silicon carbide semiconductor device comprising a semiconductor substrate and a silicon carbide single-crystal layer formed above said substrate, said silicon carbide single-crystal layer having a device active region, wherein an aluminum nitride single-crystal layer functioning as an electrically insulating layer is disposed between the silicon carbide single-crystal layer and the substrate.

5,184,200

THIN FILM SEMICONDUCTOR DEVICE WITH PARTICULAR GRAIN SIZE

Masato Yamanobe, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1992, Ser. No. 857,826

Claims priority, application Japan, Mar. 27, 1991, 3-085752

Int. Cl.[5] H01L *27/14*

U.S. Cl. 257—53 **10 Claims**

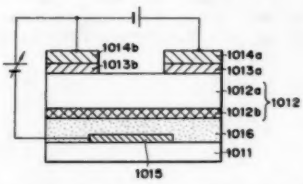
1. A semiconductor device comprising at least:

an insulative layer;

a semiconductor layer provided in contact with a first surface of said insulative layer;

first and second electrodes provided in contact with said semiconductor layer; and

a third electrode provided in contact with a second surface of said insulative layer, said second surface being opposite to said first surface,



wherein said semiconductor layer has a crystallite layer whose average grain diameter lies within a range from 50 to 350 Å and an amorphous layer.

5,184,201

STATIC INDUCTION TRANSISTOR

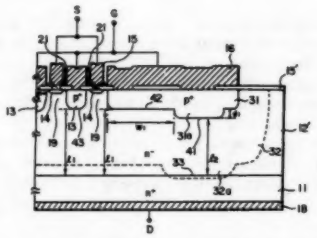
Shinobu Aoki; Haruo Takagi, and Takanori Okabe, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation-in-part of Ser. No. 533,578, Jun. 5, 1990, abandoned. This application Nov. 8, 1991, Ser. No. 793,235

Claims priority, application Japan, Jun. 7, 1989, 1-144571; Jun. 13, 1989, 1-150268

Int. Cl.[5] H01L *29/747*

U.S. Cl. 257—266 **7 Claims**



1. A static induction transistor comprising a semiconductor layer of a first conductivity type, spaced apart gate regions of a second conductivity type disposed adjacent a first major surface of said semiconductor layer, a source region of said first conductivity type formed adjacent said first major surface of said semiconductor layer in between each of said gate regions, said source regions being shallower than said gate regions, and a drain region of said first conductivity type formed on a second major surface of said semiconductor layer generally opposite said first major surface, wherein one of said gate regions is located nearer to the periphery of said semiconductor layer than the other of said gate regions and has a portion formed deeper than the remainder of said one gate region so as to protrude toward said drain region, said deeper portion of said one gate region being located at a predetermined distance from that boundary of said one gate region that is closest to a source region, said predetermined distance being greater than the distance between said protruding deeper gate portion and said drain region and spaced sufficiently close to said drain region to restrict avalanche breakdown to the area immediately below said deeper portion and prevent holes from flowing into the channel regions below said source regions.

5,184,202

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Makio Uchida, Fuchu, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

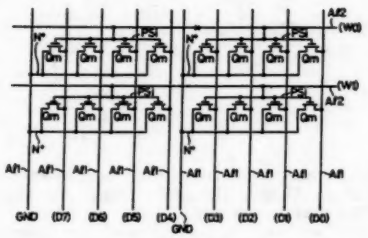
Continuation of Ser. No. 564,594, Aug. 9, 1990, Pat. No. 5,061,980, which is a continuation of Ser. No. 253,673, Oct. 5, 1988, Pat. No. 4,990,992, which is a division of Ser. No. 41,759, Apr. 21, 1987, Pat. No. 4,782,465, which is a continuation of Ser. No. 635,210, Jul. 27, 1984, abandoned. This application Jul. 29, 1991, Ser. No. 737,238

Claims priority, application Japan, Jul. 27, 1983, 58-135815

The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[5] H01L *29/78, 27/02, 27/10*

U.S. Cl. 257—390 **15 Claims**



1. A semiconductor integrated circuit device comprising:

a logic circuit; and

a memory coupled to said logic circuit for storing data, said memory including a word line, a plurality of sub-word lines each of which has first and second ends and a connecting portion at which a sub-word line is coupled to said word line with said plurality of sub-word lines substantially concurrently receiving a signal from said word line, a plurality of memory cell blocks each respectively coupled to a different one of said plurality of sub-word lines with each of said plurality of memory cell blocks including memory cells coupled between said first end and said connecting portion of the sub-word line and memory cells coupled between said second end and said connection portion of the sub-word line, a plurality of data lines which are coupled to said memory cells, and selection generator for generating and applying said signal to said word line.

5,184,203

SEMICONDUCTOR DEVICE HAVING A CHARGE TRANSFER DEVICE, MOSFETS, AND BIPOLAR TRANSISTORS—ALL FORMED IN A SINGLE SEMICONDUCTOR SUBSTRATE

Minoru Taguchi, Oomiya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 16, 1991, Ser. No. 641,920

Claims priority, application Japan, Jan. 19, 1990, 2-9576

Int. Cl.[5] H01L *27/02, 29/78*

U.S. Cl. 257—370 **7 Claims**

1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type, having a major surface;

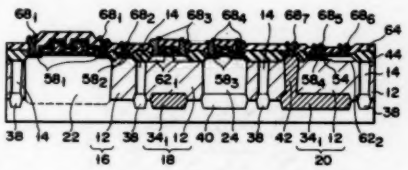
an epitaxial layer of a second conductivity type, formed on the major surface of said semiconductor substrate and having a top surface;

an isolation layer of the first conductivity type, formed in said the epitaxial layer, extending from the top surface thereof to the major surface of said semiconductor substrate, and dividing said epitaxial layer into first, second, and third islands;

a first semiconductor region of the first conductivity type, formed in said first island and extending to said major surface of said semiconductor substrate;

a second semiconductor region of the first conductivity type, formed in said second island and extending to said major surface of said semiconductor substrate;

a charge transfer device having a back gate formed of said first semiconductor region;



a first insulated-gate FET of the first conductivity type, having a back gate formed of said second island;

a second insulated-gate FET of the second conductivity type, having a back gate formed of said second semiconductor region; and

a bipolar transistor having a collector formed of said third island.

5,184,204

SEMICONDUCTOR DEVICE WITH HIGH SURGE ENDURANCE

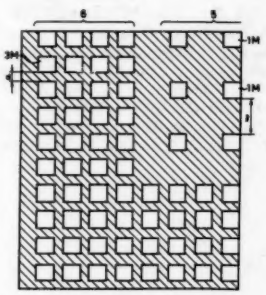
Teruyoshi Mihara, Yokosuka; Tsutomu Matsushita; Kenji Yao, both of Yokohama; Masakatsu Hoshi; Yutaka Enokido, both of Yokosuka, and Yukitsugu Hirota, Kamakura, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 24, 1991, Ser. No. 645,872

Claims priority, application Japan, Jan. 25, 1990, 2-13613

Int. Cl.[5] H01L *29/06, 29/34*

U.S. Cl. 357—629 **7 Claims**



1. A semiconductor device, comprising:

a semiconductor substrate of a first conduction type;

a group of cell diffusion layers of a second conduction type which is formed inside the semiconductor substrate and is connected to electrodes; and

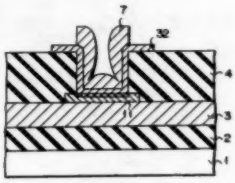
a guard ring region of the second conduction type which is surrounding the cell diffusion layers and is connected to said electrodes, the guard ring region being formed from an array having an overall ring shape formed by a plurality of interconnected guard ring cells, where each of the guard ring cells is identical in shape to each of the cell diffusion layers and the guard ring cells are electrically connected mutually.

5,184,205

SEMICONDUCTOR DEVICE HAVING MULTI-LAYERED WIRING, AND METHOD OF MANUFACTURING THE SAME

Hideki Shibata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 6, 1991, Ser. No. 711,144
Claims priority, application Japan, Jun. 7, 1990, 2-147489
Int. Cl.[5] H01L *23/54*
U.S. Cl. 257—765 2 Claims



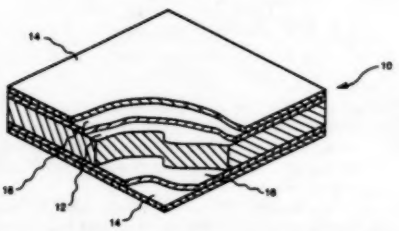
1. A semiconductor device comprising:
a semiconductor substrate;
a first metal wiring layer made of Al alloy and formed on said substrate;
a conductive film made of one material selected from the group consisting of polysilicon and silicide of metal having a high melting point, said conductive film being formed on a predetermined portion of said first metal wiring layer;
an inter-layer insulating film formed on said first metal wiring layer and said conductive film;
a contact hole formed in said inter-layer insulation film and having a diameter smaller than said conductive film;
a second metal wiring layer made of metal having a high melting point, provided in said contact hole, and connected to said conductive film; and
a third metal wiring layer made of Al alloy, formed on said second metal wiring layer, and electrically connected thereto.

5,184,206

DIRECT THERMOCOMPRESSION BONDING FOR THIN ELECTRONIC POWER CHIPS

Constantine A. Neugebauer, Schenectady; Homer H. Glascock, II, Scotia; Kyung W. Paik, Clifton Park; James G. McMullen, Pattersonville, all of N.Y., and Martha M. Neugebauer executrix of said Constantine A. Neugebauer, deceased , assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1990, Ser. No. 603,495
Int. Cl.[5] H01L *23/48, 29/40, 29/46;* B23K *31/02*
U.S. Cl. 257—762 9 Claims



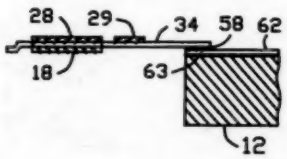
1. A metallic laminate bonded to a semiconductor substrate and comprising a first conductive metallic lamina on the substrate, a first bimetal-intermetallic lamina bonded to the first metallic lamina, a second conductive metallic lamina one side of which is bonded to said first bimetal-intermetallic lamina, and a third metallic lamina bonded to the other side of said second metallic lamina, said second metallic lamina thereby separating said third metallic lamina from direct contact with said first bimetal-intermetallic lamina and said first metallic lamina thereby separating said first bimetal-intermetallic lamina from direct contact with the substrate.

5,184,207

SEMICONDUCTOR DIE PACKAGES HAVING LEAD SUPPORT FRAME

Earl S. Cain, Napa, Calif., assignor to Tribotech, Napa, Calif.

Continuation of Ser. No. 281,016, Dec. 7, 1988, abandoned. This application Oct. 31, 1990, Ser. No. 609,088
Int. Cl.[5] H01L *23/48, 29/44*
U.S. Cl. 257—668 17 Claims



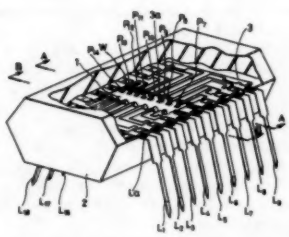
1. A lead pack for providing multiple independent electrical and mechanical lead attachments between a circuit and a semiconductor device comprising:
a lead support frame having upper and lower frame portions of insulating material sealed to one another, said lead support frame adapted to cooperate with means for packaging said semiconductor device, and
an array of spaced leads embedded between said frame portions and carried and supported solely by said lead support frame, each of said leads having one end extending inwardly inside of said frame for connection to the bonding pads of an associated semiconductor device and extending outwardly from said frame for connection to an associated circuit.

5,184,208

SEMICONDUCTOR DEVICE

Toshiyuki Sakuta, Hamura; Kazuyuki Miyazawa, Iruma; Satoshi Oguchi, Ohme; Aizo Kaneda; Masao Mitani, both of Yokohama; Shozo Nakamura, Yokohama; Kunihiko Nishi, Kokubunji, and Gen Murakami, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 212,485, Jun. 28, 1988, abandoned. This application Jan. 14, 1991, Ser. No. 640,584
Claims priority, application Japan, Jun. 30, 1987, 62-161333; Sep. 17, 1987, 62-234645
Int. Cl.[5] H01L *23/48, 29/46, 23/28, 23/02*
U.S. Cl. 257—666 34 Claims



1. A semiconductor memory device comprising:
rectangular shaped semiconductor chip having a main surface and including a first pair of end sides that are relatively longer than a second pair thereof;
two rectangular shaped memory cell array regions formed

on said main surface and arranged apart from each other, wherein each memory cell array region has one pair of longer end sides are directioned in parallel to the longer end sides of the chip;

two separate, peripheral circuit regions formed between said memory cell array regions on said main surface, wherein said two peripheral circuit regions are arranged in parallel with each other and each is extended adjacently along a relatively shorter end side of a respective one of said two rectangular shaped memory cell array regions;

a plurality of bonding pads formed between said peripheral circuit regions, at a portion of said main surface away from an outer peripheral area thereof, and arranged along the direction of the shorter end sides of said memory cell array regions, wherein each one of said two peripheral circuit regions is formed between said plurality of bonding pads, in proximity thereto, and a respective one of said memory cell array regions;

a plurality of leads, wherein each lead has an inner lead portion and an exposed outer lead portion extending outwardly from said inner lead portion, and wherein said inner lead portion has a front end part overlying said main surface of said semiconductor chip;

an insulating film interposed between the front end parts of said inner lead portions of said plurality of leads and the main surface of said semiconductor chip, wherein aid insulating film is contacting the front end parts of said inner lead portions and the main surface of said semiconductor chip;

means for electrically connecting the front end parts of said inner lead portions with said bonding pads, respectively; and

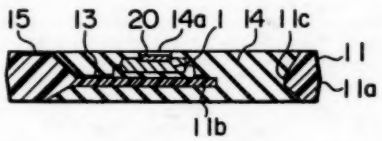
a molding resin for molding said semiconductor chip, the inner lead portions of said plurality of leads and said insulating film.

5,184,209

IC CARD AND MANUFACTURING METHOD THEREFOR

Shojiro Kodai; Katsunori Ochi, both of Itami, and Fumiaki Baba, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1990, Ser. No. 526,849
Claims priority, application Japan, May 23, 1989, 1-129302
Int. Cl.[5] H05K *7/00, 1/14*
U.S. Cl. 257—679 **27 Claims**



1. An IC card having a thickness comprising:

a molded synthetic resin circumferential frame having opposed first and second surfaces and including a periphery having a thickness extending between the first and second surfaces corresponding to the thickness of said IC card;

a circuit board unitary with and integrally molded with said circumferential frame, disposed within the periphery intermediate the first and second surfaces of said frame, including opposed third and fourth surfaces, and having an opening for the passage of resin sealant to the third and fourth surfaces during encapsulation of the IC card;

electric circuit means disposed on at least one of said third and fourth surfaces including an I/O portion disposed on one of said circuit board and said periphery for supplying information to and receiving information from external equipment; and

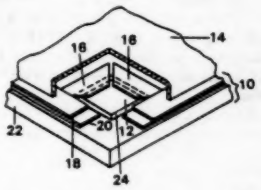
a resin sealant covering the third and fourth surfaces of said circuit board, hermetically encapsulating said electric circuit means, and having a thickness no greater than the thickness of said periphery, said resin sealing being disposed within said frame to form a card-like shape.

5,184,210

STRUCTURE FOR CONTROLLING IMPEDANCE AND CROSS-TALK IN A PRINTED CIRCUIT SUBSTRATE

Scott R. Westbrook, Los Altos, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 496,811, Mar. 20, 1990, abandoned. This application Mar. 13, 1991, Ser. No. 668,387
Int. Cl.[5] H01L *23/12;* **H01P** *3/08;* **H03K** *17/80*
U.S. Cl. 257—664 **23 Claims**



1. A signal carrying arrangement for an electronic circuit, comprising:

a multilayered substrate having

a signal layer including signal traces for carrying signals in the electronic circuit,

a layer of dielectric material disposed adjacent the signal layer, and

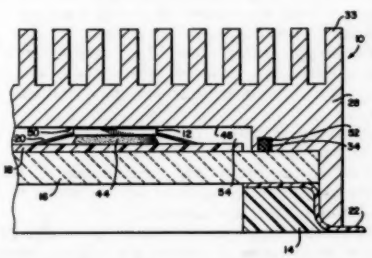
a signal cover layer, disposed such that the dielectric material is between the signal layer and the signal cover layer, including ventilation apertures therein which are spaced so that each of the signal traces traverses approximately an equal number of the apertures to reduce degradation of the signals in the signal traces.

5,184,211

APPARATUS FOR PACKAGING AND COOLING INTEGRATED CIRCUIT CHIPS

Leslie R. Fox, Boxborough, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 162,671, Mar. 1, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 485,850
Int. Cl.[5] H01L *23/12, 23/24, 23/34*
U.S. Cl. 257—706 **20 Claims**



1. As assembly for packaging and cooling circuit chips comprising:

a base;

compliant mean disposed on said base;

a heat sink for engagement with said base having an inner top surface; and

a clamshell housing completely surrounding at least a first

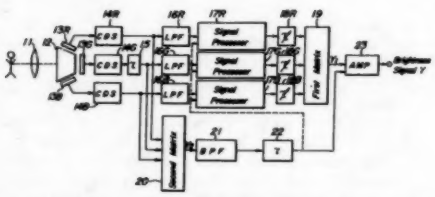
circuit chip, said clamshell housing being held in position between said compliant means and the inner top surface of said heat sink.

5,184,212

CIRCUIT FOR PRODUCING BRIGHTNESS SIGNAL FROM OUTPUT SIGNAL OF SOLID STATE IMAGE PICK-UP APPARATUS USING SPATIAL PIXEL SHIFT

Kazumi Yamamoto, Yokohama, and Masayuki Sugasawa, Tokyo, both of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1991, Ser. No. 756,334
Claims priority, application Japan, Sep. 12, 1990, 2-240093
Int. Cl.[5] H04N *9/09*
U.S. Cl. 358—39 11 Claims



1. A circuit for producing a brightness signal from output color signals of a solid state image pick-up apparatus, in which at least two solid state image sensor s each having a number of light receiving elements arranged in matrix are arranged in such a manner that light receiving elements of one solid state image sensor are shifted spatially in a main-scanning direction over a distance substantially equal to one-half of a pitch of successive light receiving elements with respect to light receiving elements of the other solid state image sensor, comprising:

delaying means for delaying an output signal generated by said one solid state image sensor by a delay time corresponding to one-half of a spatial sampling period so that a phase of the output signal of said one solid state image sensor is made to coincide with a phase of an output signal of said other solid state image sensor;

first filtering means for cutting off higher frequency components contained in an output signal of said delaying means and in the output signal of said other solid state image sensor;

signal processing means for processing output signals of said first filtering means;

first matrix means for adding output signals of said signal processing means to each other at a predetermined ratio to produce a first brightness signal;

second matrix means for adding the output signal of said delaying means and the output signal of said other solid state image sensor to each other at a ratio of 1:1 to derive a second brightness signal;

second filtering means for extracting a high frequency component from said second brightness signal; and

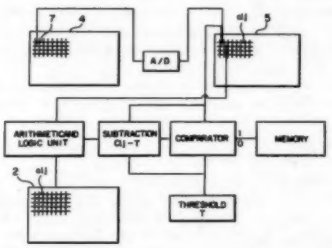
adding means for adding said high frequency component derived by said second filtering means to said first brightness signal.

5,184,213

BINARIZING METHOD FOR COLOR IMAGE USING MODIFIED ERROR DIFFUSION METHOD

Roh Ishida, Chiba, Japan, assignor to Toyo Ink Mfg. Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 583,306, Sep. 14, 1990, abandoned. This application Mar. 19, 1991, Ser. No. 671,417
Claims priority, application Japan, Sep. 20, 1989, 1-244734; Japan, Sep. 20, 1990, 2-250944; Feb. 14, 1991, 3-42716; Feb. 14, 1991, 3-42718
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—75 15 Claims



1. A method for color image information processing to reproduce multivalued color halftone image information by use of an output device capable of recording in binary values, comprising the steps of:

preparing a diffusion coefficient matrix with periodicity in a 1- or 2-dimensional direction, and storing said diffusion coefficient matrix in a memory;

binarizing by use of a comparator, an object value that is a density value of a referred input pixel of a color image or the sum of density value and error values, by comparison with a threshold, said comparator being operative to compare said object value with the threshold;

employing an arithmetic logic unit to accomplish a dividing of a difference between said object value and the threshold into error values in a size proportional to the coefficients as elements in the partial matrix by use of said partial matrix, said partial matrix being part of said diffusion coefficient matrix, said periodicity in 1-dimensional or 2-dimensional direction consisting of the elements fixedly corresponding to each position of the input pixel;

providing correspondence between the position of said partial matrix and a position of said referred input pixel; and

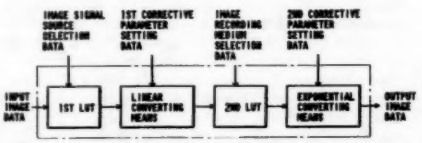
adding said error values to the object values of the input pixels that correspond to the elements of said partial matrix of the diffusion coefficient matrix.

5,184,214

IMAGE OUTPUT SYSTEM

Setsuji Tatsumi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 7, 1990, Ser. No. 563,649
Claims priority, application Japan, Aug. 8, 1989, 1-206237
Int. Cl.[5] H04N *1/46, 9/04;* G03F *3/08*
U.S. Cl. 358—75 5 Claims



1. An image output system for processing an input image signal from an image signal source to produce an output image

signal to record an image on an image recording medium, comprising:

a first look-up table for converting an input image signal into an image signal which matches the image output system, said first look-up table being selected to match the image signal source;

linear converting means for linearly converting said image signal, which has been converted by said first look-up table, into an image signal based on first corrective parameters set to achieve given color tone;

a second look-up table for converting said image signal, which has been converted by said linear converting means, into an image signal which matches the image recording medium, said second look-up table being selected to match the image recording medium; and

exponential converting means for converting said image signal, which has been converted by said second look-up table, into an exponential output image signal based on second corrective parameters set to achieve given color tone.

5,184,215

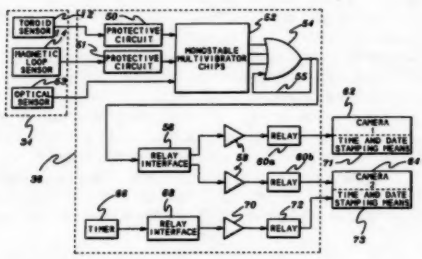
LIGHTNING DETECTING AND RECORDING SYSTEM

Philip P. Barker, Schenectady, N.Y., assignor to Niagara Mohawk Power Corporation, Syracuse, N.Y.

Filed Nov. 26, 1991, Ser. No. 800,454

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—93 **39 Claims**



1. An automated system for detecting and recording a lightning strike in the vicinity of a power line, said system comprising:

a housing having at least one viewport;

first automated means for detecting a magnetic field disturbance resulting from said lightning strike in the vicinity of said power line, said first automated means outputting a first signal representative of said lightning strike when said lightning strike is detected;

second automated means for detecting light resulting from said lightning strike in the vicinity of said power line, said second automated means outputting a signal when light is detected;

means for filtering said signal output from said second automated means, said filtering means outputting a second signal representative of said lightning strike when said output signal from said second automated means is above a preselected level;

control means coupled to receive the output of said first automated means and the output of said filtering means, said control means outputting a third signal in response to receiving at least one of said first signal and said second signal; and

means responsive to the output of said control means for visually recording said lightning strike and a subsequent lightning strike in a flash in the vicinity of said power line, said recording means being located within said housing adjacent said at least one viewport for visually recording said lightning flash through said viewport.

5,184,216

IMAGE SENSING APPARATUS HAVING CAMERA-SHAKE DETECTION FUNCTION

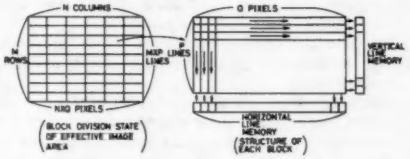
Akio Kobayashi, Hirakata, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 29, 1991, Ser. No. 677,188

Claims priority, application Japan, Mar. 30, 1990, 2-85304; May 29, 1990, 2-141144; Jun. 22, 1990, 2-164801

Int. Cl.[5] H04N *5/225*

U.S. Cl. 358—105 **6 Claims**



1. An image sensing apparatus having camera-shake detection function comprising:

image sensing means for receiving light from an object and converting the same into a video signal,

binary coding means for dividing an image sensed picture into a plurality of blocks and binary coding said video signal at a plurality of sampling points in each block by comparing the same with a first reference value determined for each block,

distribution data calculating means for calculating data representing the distribution position of the object in the vertical direction and the horizontal direction in each block according to said binary coded data for each block,

motion vector specifying means for specifying a motion vector of the object for each block according to said data representing the distribution position of the object, and

motion vector selecting means for selecting a motion vector of the object of an entire image sensed picture by logic process based on said specified motion vectors for respective blocks.

5,184,217

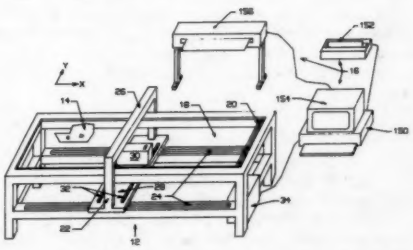
SYSTEM FOR AUTOMATICALLY INSPECTING A FLAT SHEET PART

John W. Doering, 18252 Lincoln St., Villa Park, Calif. 92667

Filed Aug. 2, 1990, Ser. No. 562,025

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—106 **18 Claims**



1. A system for automatically inspecting a workpiece for the perimeter and holes formed therein, said system comprising of:

an inspection table having a transparent scratch resistant glass surface upon which the workpiece is to be laid;

an etched glass calibration scale located at the edge of the glass surface of the table for sensor table calibration;

a carriage mounted on rails on the table which is movable in a first direction; containing a light source, and an optical

sensor module which is movable in a second direction perpendicular to the first;

an imaging sensor with a plurality of photo sensing elements, a lens, two flat mirrors and a curved mirror situated within said optical sensor module;

a video sensor board situated with said optical sensor module;

a computer controlled two axis motion controller for controlling the positioning of the carriage in one direction and the optical sensor module in a second direction perpendicular to the first; and

a computer workstation interfacing with the motion controller, imaging sensor and video sensor board; providing the means for carriage motion control, and the processing of edge address data for workpiece perimeter and hole inspection;

wherein the curved mirror is a spherical section curved at a radius which aligns the viewing angle of each photo sensing element of the sensor so that it is perpendicular to and focused at the surface of the transparent table top.

5,184,218

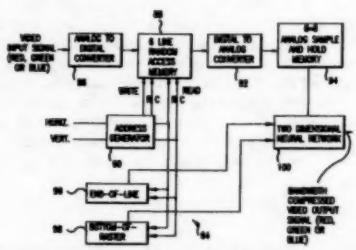
BANDWIDTH COMPRESSION AND EXPANSION SYSTEM

Richard C. Gerdes, Scottsdale, Ariz., assignor to WavePhore, Inc., Tempe, Ariz.

Filed Jul. 3, 1991, Ser. No. 725,563

Int. Cl.[5] H04N *7/01, 7/12*

U.S. Cl. 358—133 **31 Claims**



1. An arrangement for modifying the bandwidth of an analog input signal comprising the combination of means for periodically examining the analog input signal within a sampling region encompassing a first plurality of values of the analog input signal and within a subsampling region encompassing a second plurality of values of the analog input signal within a portion of the sampling region, and means responsive to each examining of the analog input signal for providing a corresponding output signal representing the second plurality of values within the subsampling region and related to those of the first plurality of values not included in the second plurality of values.

5,184,219

METHOD FOR TRANSMITTING SPECTRUM-COMPATIBLE HIGH-DEFINITION TELEVISION SIGNAL AND CIRCUIT THEREFOR IN A TELEVISION SIGNAL TRANSMISSION SYSTEM

Hyun-Deok Cho, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 26, 1991, Ser. No. 691,856

Claims priority, application Rep. of Korea, May 12, 1990, 1990-6789

Int. Cl.[5] H04N *7/04, 11/06*

U.S. Cl. 358—141 **44 Claims**

1. A circuit for transmitting spectrum-compatible high-definition television signals in a television signal transmission system, said circuit comprising:

analog-to-digital converter for converting analog luminance signal and chrominance signals into a digital signal;

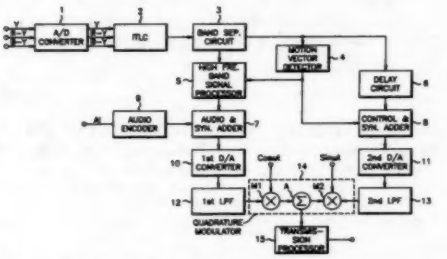
means for integration by compressing on a time-base said digital signal;

band separation means for separating the output signal of said means for integration into a low frequency band signal and a high frequency band signal;

motion vector detection means for detecting a motion vector signal from the low frequency band signal;

high frequency processing means for processing the high frequency band signal of said band separation means in response to the motion vector signal;

first synchronizing means for adding the low frequency signal to the motion vector signal;



a first digital-to-analog converter for converting the output signal of said high frequency processing means to a first analog signal;

a second digital-to-analog converter for converting the output signal of said first synchronizing means to a second analog signal; and

quadrature modulation means for multiplying the first analog signal and the second analog signal by a first sinusoidal signal and a second sinusoidal signal, respectively, to provide a first multiplied signal and a second multiplied signal, and for synthesizing the first multiplied signal and second multiplied signal to provide a transmission signal.

5,184,220

TELETEXT DECODER APPARATUS INCLUDING FEATURE OF INHIBITING GENERATION OF AN END-OF-PAGE SIGNAL

John R. Kinghorn, Brockenhurst, and Jeremy R. Stevens, Lymington, both of United Kingdom, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jan. 28, 1991, Ser. No. 647,620

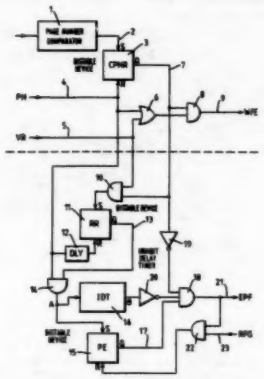
Claims priority, application United Kingdom, Jan. 31, 1990, 9002118

Int. Cl.[5] H04N *7/087, 7/04, 7/08*

U.S. Cl. 358—147 **14 Claims**

1. A teletext decoder comprising: means for detecting the page header of a required teletext page, means for detecting the next following page header, and means responsive to the detection of said next following page header for generating an end of page signal, means for detecting at least one row of said required teletext page, and means for inhibiting the generation of

said end of page signal if 1) at least one row of said required teletext page has not been detected, or 2) there has been a



subsequent detection of a further page header of said required teletext page within a predetermined period.

5,184,221

APPARATUS FOR REMOVING GHOST COMPONENT DISTURBING PICTURE SIGNAL

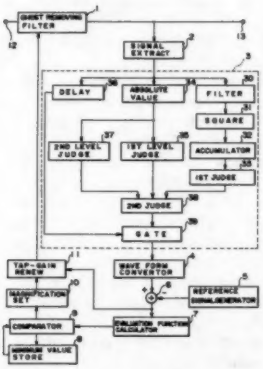
Yuji Nishi, Iwai; Shigehiro Ito, Toride; Tatsushi Kuguchi, Iwai, and Kazuyuki Ebihara, Toride, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 29, 1991, Ser. No. 783,826

Claims priority, application Japan, Oct. 29, 1990, 2291043

Int. Cl.[5] H04N *5/210*

U.S. Cl. 358—167 **4 Claims**



1. An apparatus for removing a ghost component which disturbs a picture signal by means of a ghost canceling reference signal included therein, including:

ghost removing filter means for removing the ghost component;

signal extracting means for extracting the reference signal from the picture signal by canceling a color burst signal and other signal components included therein except the reference signal;

waveform judging means for judging whether the extracted reference signal has a specific waveform;

signal inspection means for inspecting disturbance of the extracted reference signal suffered from the ghost component, if the extracted reference signal is judged to have the specific waveform; and

characteristic varying means, responsive to the inspection, for varying filtering characteristics of the filter means, wherein

the waveform judging means comprises:

level judging means for judging whether the extracted reference signal has a specific level in a reference time interval;

signal judging means for judging whether the color burst signal is canceled in the extracted reference signal;

signal outputting means for outputting a judgement signal if the extracted reference signal is judged to have the specific level in the reference time interval and the color burst signal is judged to be canceled; and

gate means, responsive to the judge signal, for applying the extracted reference signal to the signal inspection means.

5,184,222

WIPE GENERATOR HAVING START POSITION AND WIDTH CONTROLLER

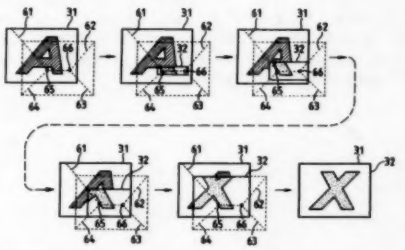
Ryogo Yanagisawa, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 2, 1991, Ser. No. 636,803

Claims priority, application Japan, Jan. 19, 1990, 2-11294; Apr. 20, 1990, 2-106190

Int. Cl.[5] H04N *5/262*

U.S. Cl. 358—183 **7 Claims**



1. A wipe waveform signal generating apparatus comprising:

a wipe width generator generating a wipe width;

a wipe waveform extended width holding device outputting a horizontal extended width and a vertical extended width;

a wipe waveform calculator receiving the wipe width, the horizontal extended width, and the vertical extended width, and outputting a rectangular-area horizontal width, a rectangular-area vertical width, a rectangular-area horizontal starting position, and a rectangular-area vertical starting position; and

a change signal generator receiving the rectangular-area horizontal width, the rectangular-area vertical width, the rectangular-area horizontal starting position, and the rectangular-area vertical starting position, and outputting a wipe waveform signal.

5,184,223

ELECTRONIC IMAGING APPARATUS

Shinichi Mihara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1991, Ser. No. 692,254

Claims priority, application Japan, Apr. 28, 1990, 2-114447; May 29, 1990, 2-139468

Int. Cl.[5] H04N *5/30*

U.S. Cl. 358—209 **3 Claims**

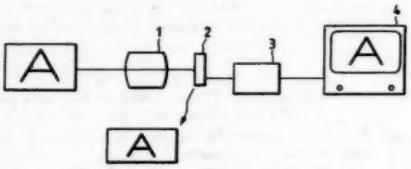
1. An electronic imaging apparatus comprising:

an imaging optical system including an imaging lens system for forming an image of an object at magnifications different between an x-z section and a y-z section when the

object is placed on a z-axis in a three dimensional x-y-z space and an image sensor having a photoelectric converting surface substantially perpendicular to the z-axis for receiving said object image; and

a video signal processing circuit connected to said image sensor for changing a difference in expansion/contraction ratios between a scanning direction and a direction perpendicular thereto for reproducing said object image with video signals obtained from said image sensor;

wherein said imaging optical system comprises an anamorphic optical system and satisfies the condition:



$$|\Delta d| < 2\delta F/\beta^2$$

wherein Δd is the paraxial astigmatic difference in image between the x-z section and the y-z section of said anamorphic optical system, δ is the length of the shorter side of each pixel element of the image sensor, F is the F number of the imaging lens system, and β is the magnification of the optical system located on the image side of said anamorphic optical system.

5,184,224

TELEVISION PROJECTION SCREEN HAVING ANTI-STATIC ELEMENTS

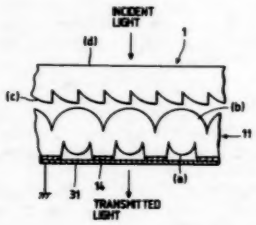
Katsuaki Mitani; Toshiaki Matsumura, and Noboru Yasumatsuya, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 3, 1991, Ser. No. 725,077

Claims priority, application Japan, Jul. 3, 1990, 2-176144

Int. Cl.[5] H04N *5/74, 5/64, 5/72*

U.S. Cl. 358—231 **19 Claims**



1. A transmission-type screen comprising:

a lenticular lens for transmitting rays of light therethrough; and

an electrically conductive layer mounted on a surface of said lenticular lens for preventing said surface from being electrostatically charged.

5,184,225

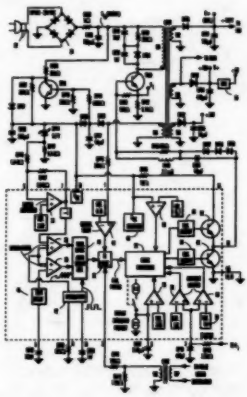
TELEVISION RECEIVER WITH SPOT BURN PROTECTION AND AFTER-GLOW SUPPRESSION

Wolfgang Heidebroek, and Zeith W. C. Hsing, both of Singapore, Singapore, assignors to Thomson Consumer Electronics, S.A., Courbevoie, France

Filed Jul. 3, 1991, Ser. No. 725,052

Int. Cl.[5] H04N *3/20, 3/24*

U.S. Cl. 358—243 **2 Claims**



1. A television receiver comprising a kinescope, a driver amplifier for driving said kinescope, a high voltage supply, a deflection circuit, a control circuit for generating a turn-off command signal to cause said television receiver to change from a "run" operating mode to a "stand-by" operating mode during a transition interval; and circuit means responsive to said turn-off command for disabling said high voltage supply and for initiating turn-off of said deflection circuit at a controlled rate during said transition interval: characterized in that:

said driver amplifier comprises a high voltage amplifier and a low voltage amplifier;

said high voltage amplifier includes a signal input for receiving a picture representative video signal, a control input for receiving a control signal and an output coupled to an electron gun of said kinescope;

said high voltage amplifier responding to a given level of said control signal applied to said control input for over-riding any value of said picture representative video signal applied to said signal input such that said high voltage driver amplifier causes said electron gun to produce a maximum output electron beam level;

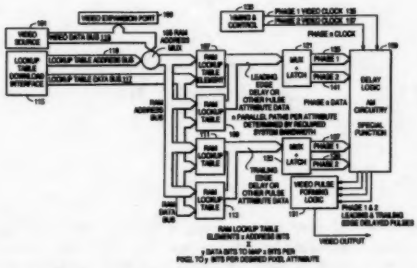
said low voltage amplifier having a first input for receiving an on-screen display character signal, having a second input coupled to receive said turn-off command signal and having an output coupled to said control input of said high voltage amplifier;

said low voltage amplifier being responsive to said turn-off command during said transition interval for over-riding any value of said character signal to cause said control signal to exhibit said given level, thereby over-riding said said picture representative signal in said high voltage amplifier during said transition interval so as to produce said maximum output electron beam level for discharging high voltage from said kinescope and for producing a display on said kinescope of uniform brightness across the display raster to as to prevent amplitude characteristics of either said picture representative signal or said on-screen display character signal from causing spot burn damage to said kinescope during said transition interval.

5,184,226
DIGITAL VIDEO PULSE WIDTH AND POSITION MODULATOR

Michael S. Cianciosi, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1991, Ser. No. 783,011
Int. Cl.[5] H04N *1/40*; G01D *9/42*
U.S. Cl. 358—296 **15 Claims**



1. A digital electronics system for generating pulses from a series of data words comprising:

means for translating the series of data words into a series of pulse attribute words, wherein each of said pulse attribute words includes information for controlling a formation of a corresponding pulse;

means for splitting the series of pulse attribute words into two channels;

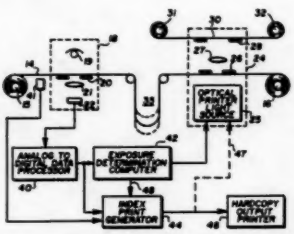
means corresponding to each channel and accepting pulse attribute words from respective channels, for forming pulses using the information included in the pulse attribute words for controlling the formation of the pulses; and

means for generating the pulses, wherein a first pulse is generated while a second pulse is being formed by the forming means.

5,184,227
PHOTOGRAPHIC PRINTER WITH INDEX PRINT GENERATION

Walter D. Foley, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 21, 1991, Ser. No. 795,585
Int. Cl.[5] H04N *1/387, 1/46*; G03B *1/00*
U.S. Cl. 358—302 **4 Claims**



1. A photographic printer having a print station for generating photographic prints from photographic film frame images and being adapted to produce index print images corresponding to said photographic prints, the printer comprising:

exposure determination film frame image scanner means independent of the print station for generating scanned film frame image signals to be used in determining print exposure operating conditions at the print station;

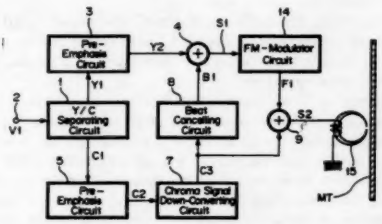
index print signal generating means responsive to said scanned film frame image signals for processing and storing said scanned film frame image signals as a matrix of film frame image signals suitable for use in producing an index print;

and printer output means responsive to a predetermined series of the stored scanned film frame image frame signals in said matrix for generating an index print therefrom.

5,184,228
RECORDING CIRCUIT FOR MIRROR MOTHER TAPE

Toshiharu Kobayashi, and Keisuke Unno, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 27, 1991, Ser. No. 722,170
Claims priority, application Japan, Jul. 5, 1990, 2-178232
Int. Cl.[5] H04N *9/79, 9/83*
U.S. Cl. 358—310 **4 Claims**



1. An apparatus for recording, on a mirror mother tape to be used in contact printing process, an incoming color video signal including a chrominance signal and a luminance signal, said apparatus comprising:

means for down converting said chrominance signal into a down converted chrominance signal having a reduced carrier frequency fC;

means for generating, from said down converted chrominance signal, a beat cancelling signal having a frequency 2 fC;

means for adding said beat cancelling signal to said luminance signal so as to generate an added signal;

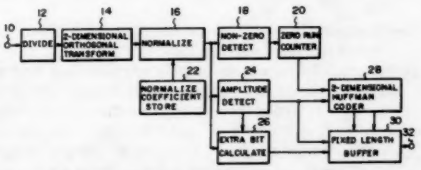
means for combining said down converted chrominance signal with said added signal so as to provide a combined signal; and

means for recording said combined signal on the mirror mother tape.

5,184,229
COMPRESSION CODING DEVICE AND EXPANSION DECODING DEVICE FOR PICTURE SIGNAL

Osamu Saito; Kenji Ito; Kenji Moronaga, and Mikio Watanabe, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 1, 1989, Ser. No. 444,701
Claims priority, application Japan, Dec. 9, 1988, 63-309870; Mar. 31, 1989, 1-78288
Int. Cl.[5] H04N *1/41*
U.S. Cl. 358—427 **17 Claims**



1. A device for coding a picture signal by dividing a single picture of digital picture data into a plurality of blocks and

compressing said digital picture data block by block, comprising:

coding means for coding each of the plurality of blocks of digital picture data;

region data detecting means, operatively communicative with said coding means, for detecting that the individual blocks of digital picture data lie in a predetermined range;

output data producing means, operatively communicative with said region data detecting means, for producing output data which includes the coded data;

said output data producing means outputting, depending on whether said digital picture data lies in said predetermined range, data specifying said digital picture data in addition to the coded data produced by said coding means;

orthogonal transforming means for applying two-dimensional orthogonal transform to the individual blocks of digital picture data; and

normalizing means for normalizing the transformed data produced by said orthogonal transforming means;

said coding means coding the normalized data produced by said normalizing means;

said region data detecting means comprising overflow detecting means for detecting that an amplitude of the normalized data has exceeded said predetermined range;

said output data producing means outputting, when said overflow detecting means has detected that the amplitude of the normalized data has exceeded said predetermined range, the data specifying the normalized data in addition to the coded data produced by said coding means.

5,184,230

UNDERWATER INSPECTION APPARATUS AND METHOD

John Watson, Alford, Scotland, assignor to British Technology Group Limited, London, England

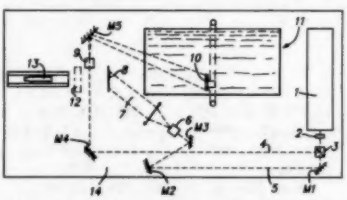
PCT No. PCT/GB89/00743, § 371 Date Dec. 31, 1990, § 102(e) Date Dec. 31, 1990, PCT Pub. No. WO90/00269, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 30, 1989, Ser. No. 634,120

Claims priority, application United Kingdom, Jul. 1, 1988, 8815660

Int. Cl.[5] G03H *3/00*

U.S. Cl. 359—9 **5 Claims**



1. A holographic recording and reproducing system comprising:

means for using a beam of radiation from a source for recording holographic images of an object positioned in a first medium and replaying said images in a second medium;

means selectively responsive to the polarization of radiation reflected from said source; and

gating means for selectively limiting an extent, in a direction of propagation of said radiation, of the region from which images are recorded substantially to reduce the effect on a photosensitive medium of radiation other than radiation capable of producing said holographic images, wherein said gating means includes coherence gating means selectively to receive radiation from a predetermined target region.

5,184,231

HELMET SYSTEMS

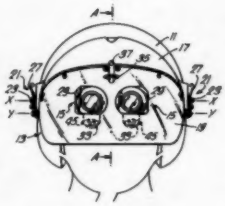
Stafford M. Ellis, East Preston, England, assignor to GEC-Marconi Limited, England

Filed Mar. 19, 1987, Ser. No. 35,042

Claims priority, application United Kingdom, Mar. 26, 1983, 8607586; Mar. 22, 1986, 8607162

Int. Cl.[5] G02B *27/64;* A42B *3/00*

U.S. Cl. 359—13 **7 Claims**



1. A helmet system comprising: a helmet; a vizor which is angularly displaceable with respect to the helmet about a transverse axis fixed with respect to the helmet; and an electro-optical system including a combiner eyepiece through which a user of the helmet system is able to view a scene forward of the user and which serves to reflect light rays derived from a display surface of the electro-optical system to the user to provide the user with a virtual image of the display surface superimposed on his view of the forward scene through the eyepiece; and wherein the electro-optical system is mounted on the said vizor so as to be angularly displaceable therewith about said transverse axis, and so that said eyepiece is positioned, when the vizor is in use, between a transparent part of the vizor and an eye of the user.

5,184,232

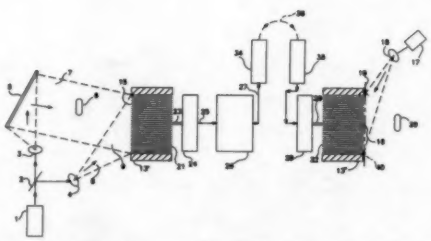
HOLOGRAPHIC DISPLAY IMAGING PROCESS

Michael Burney, 618 Lincoln Blvd. No. 5, Santa Monica, Calif. 90402

Continuation-in-part of Ser. No. 919,551, Oct. 15, 1986, abandoned, which is a continuation-in-part of Ser. No. 788,248, Oct. 17, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 102,780

Int. Cl.[5] G02B *1/04, 1/22;* H04N *13/00*

U.S. Cl. 359—32 **21 Claims**



1. A holographic apparatus for continually sensing, transmitting and reconstructing a three-dimensional image comprising:

a means for receiving a continuously changeable holographic interference pattern, said means for receiving a continuously changeable holographic interference pattern comprising an end of a bundle of fiber optic fibers;

a means for continuously creating a changeable holographic interference pattern which is representative of a three-dimensional image on said receiving means;

a means for transmitting the received holographic interference pattern;

a means for continuously recreating said continuously changeable holographic interference pattern from said transmitted holographic interference pattern; and

a source of light illuminating said recreated changeable holographic interference pattern on said means for continuously recreating said continuously changeable holographic interference pattern; whereby the sensed three-dimensional image is reconstructed.

5,184,233

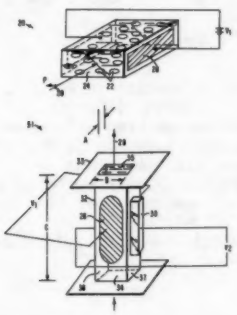
LIQUID CRYSTAL-BASED COMPOSITE MATERIAL INCLUDING ELECTRICALLY CONDUCTING ELONGATED PARTICLES AND HAVING ENHANCED MICROWAVE BIREFRINGENCE

Khoon C. Lim, Agoura; J. David Margerum, Woodland Hills; Anna M. Lackner, Los Angeles, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 573,503, Aug. 24, 1990, abandoned. This application Mar. 30, 1992, Ser. No. 863,501

Int. Cl.[5] G02F *1/137, 1/13*

U.S. Cl. 359—46 **19 Claims**



1. A microwave phase modulating cell, comprising:

a microwave wave guide;

a phase modulating medium disposed within the wave guide, the phase modulating medium comprising a liquid crystal having a dispersion of electrically conducting, elongated particles therein; and

means for controllably aligning the particles and the liquid crystal in a first direction in the phase modulating medium, wherein the means for controllably aligning aligns the particles with the liquid crystal when the particles and liquid crystals are aligned in the first direction.

14. A method for modulating the phase of a microwave, comprising the steps of:

providing a microwave phase modulating cell comprising:

a phase modulating medium, the phase modulating medium comprising a liquid crystal having a dispersion of electrically conducting, elongated particles therein, and

means for controllably aligning the particles and the liquid crystal in a selected direction in the phase modulating medium;

directing a beam of microwave energy through the cell in a microwave propagation direction; and

controllably aligning the particles and the liquid crystal in the selected direction, which includes aligning the particles with the liquid crystal, thereby changing the microwave index of refraction of the phase modulating medium.

5,184,234

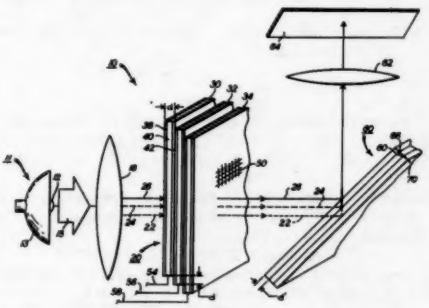
STACKED LCD COLOR PROJECTOR WITH EQUAL PATH LENGTHS

Christopher W. Mathewson, Rochester, N.Y., assignor to Sayett Group, Inc., Rochester, N.Y.

Filed Sep. 20, 1991, Ser. No. 764,145

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—53 **25 Claims**



1. Display apparatus comprising:

illumination means for creating an illumination beam;

first modulation means in the illumination beam having an array of modulation sites for forming an image;

second modulation means in the illumination beam having an array of modulation sites for forming a second image offset from the array of modulation means separated by a separation distance along the illumination beam;

path length compensating means in the illumination beam.

5,184,235

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY PANEL WITH AN ELECTROSTATIC PROTECTION CIRCUIT

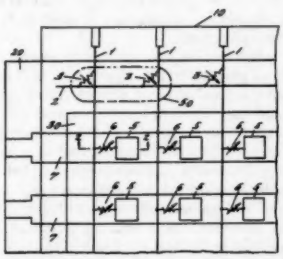
Osamu Sukegawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 661,225, Feb. 27, 1991, abandoned, which is a continuation of Ser. No. 438,766, Nov. 17, 1989, abandoned. This application Aug. 26, 1991, Ser. No. 758,262

Claims priority, application Japan, Nov. 18, 1988, 63-291608

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—60 **9 Claims**



1. An active matrix liquid crystal display panel, comprising:

a lower substrate having a display portion and a separate periphery portion;

a plurality of pixel electrodes formed in said display portion on said lower substrate organized in a matrix including columns and rows;

a plurality of first lines formed on said lower substrate traversing said display portion and extending to said periphery portion, said first lines being connected respectively to said pixel electrodes of each column by first diodes;

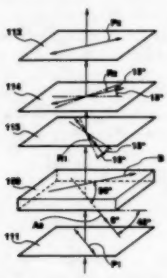
an upper substrate;
a plurality of second lines formed on a lower surface of said upper substrate, said second lines being provided respectively over each row of said pixel electrodes;
liquid crystal inserted between said display portion of said lower substrate and said lower surface of said upper substrate;
a wiring formed on the periphery portion of said lower substrate separately from said pixel electrodes and said first lines, said wiring being being formed to cross said first lines; and
a plurality of second diodes connected between said wiring and said first lines.

5,184,236

TWISTED NEMATIC LIQUID CRYSTAL DISPLAY DEVICE WITH RETARDATION PLATES HAVING PHASE AXIS DIRECTION WITHIN 15° OF ALIGNMENT DIRECTION

Takashi Miyashita, Hachioji; Yoshinaga Miyazawa, Fussa, and Zenta Kikuchi, Hamura, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1991, Ser. No. 739,832
Claims priority, application Japan, Aug. 10, 1990, 2-85308[U]; Sep. 10, 1990, 2-239353; Sep. 10, 1990, 2-239354
Int. Cl.[5] G02F *1/1335, 1/137*
U.S. Cl. 359—63 **19 Claims**



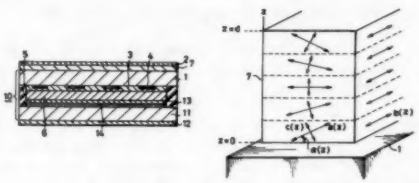
19. An active matrix liquid crystal display device having thin film transistors, comprising:
a first substrate, on one surface of which at least one common electrode and a first aligning film covering said first electrode are formed, said first aligning film covering at least a portion of said one surface of said first substrate and being executed by an aligning treatment in a predetermined first direction;
a second substrate, on one surface of which are formed a plurality of pixel electrodes, a plurality of thin film transistors, and a second aligning film covering said pixel electrodes and said thin film transistors, said thin film transistors being connected to said pixel electrodes and operated by a scanning signal and a data signal to be supplied from a scanning line and a data line of said pixel electrodes, said second aligning film covering at least a portion of said one surface of said second substrate and being executed by an aligning treatment in a second direction substantially perpendicular to the first direction of the first aligning film of said first substrate;
a seal member for bonding said first substrate to said second substrate with a predetermined gap therebetween so that the common electrode on said first substrate is opposed to the pixel electrodes on said second substrate;
a liquid crystal contained in a region defined by said first substrate, said second substrate and said seal member, and forming a liquid crystal layer in the region, liquid crystal molecules of said liquid crystal being aligned in a state such that they are twisted substantially 90°, and said liquid crystal layer having a refractive-index anisotropy Δn and a liquid crystal layer thickness d such that the value of a product Δn-d of the refractive-index anisotropy Δn and the liquid crystal layer thickness d of the liquid crystal is from 350 nm to 700 nm;
a pair of polarizing plates disposed outside of said first substrate and said second substrate to sandwich the substrates therebetween, a polarizing axis of a first of said polarizing plates being directed toward a direction perpendicular to or parallel to said first direction of the first aligning film of said first substrate, and a polarizing axis of a second of said polarizing plates being directed to cross at substantially a right angle to said first of said polarizing plates;
a first retardation plate disposed between one of said pair of first and second polarizing plates and said first substrate so that a direction of a delayed phase axis thereof is equal to said first direction of the first aligning film of said first substrate or different from said first direction within a range from −15° to +15°, and said first retardation plate having a refractive-index anisotropy Δn and a thickness d such that the product Δn-d of the refractive-index anisotropy Δn and the thickness d is from 300 nm to 600 nm; and
a second retardation plate disposed between the other of said pair of first and second polarizing plates and said second substrate so that a direction of a delayed phase axis thereof is substantially perpendicular to the direction of the delayed phase axis of said first retardation plate, and said second retardation plate having a refractive-index anisotropy Δn and a thickness d such that the product Δn-d of the refractive-index anisotropy Δn and the thickness d is substantially equal to the value of Δn-d of said first retardation plate.

5,184,237

SUPER-TWISTED NEMATIC TYPE LIQUID CRYSTAL DISPLAY DEVICE

Haruo Iimura, Yokohama; Yasuyuki Takiguchi, Kawasaki, and Akihiko Kanemoto, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1991, Ser. No. 669,576
Claims priority, application Japan, Mar. 27, 1990, 2-77393; Mar. 27, 1990, 2-77394
Int. Cl.[5] G02F *1/1335, 1/135, 1/1333*
U.S. Cl. 359—63 **15 Claims**



1. A liquid crystal display device comprising:
(a) a liquid crystal cell including a pair of substrates, each substrate having at least one transparent electrode and at least one aligning film, and a liquid crystal composition layer, having a positive dielectric anisotropy, positioned between the substrates, long axes of the liquid crystal molecules being aligned nearly homogeneously in a plane parallel to the substrate in the absence of an applied field and the molecules being twisted in an angle of 120° to 360° in a direction perpendicular to the substrate;
(b) a pair of polarizers positioned on opposite sides of the cell; and
(c) a first birefringent layer positioned between the cell and a first one of the polarizers, wherein said first birefringent layer has a first maximum refractive index direction at a first plane contacting the polarizer, and a second maximum refractive index direction at a second plane contact-

ing the liquid crystal cell, the first and second directions are tilted relative to a plane parallel to one of the substrates, angles made between each of the first and second directions and the parallel plane are aligned symmetrically about the parallel plane, and angles made between the parallel plane and the maximum refractive index directions in the first birefringent layer vary continuously along the direction perpendicular to one of the substrates.

5,184,238

APPARATUS FOR PROJECTING LIGHT ONTO A SURFACE HAVING REFLECTOR MEANS FOR IMPROVING THE BRIGHTNESS OF THE IMAGE

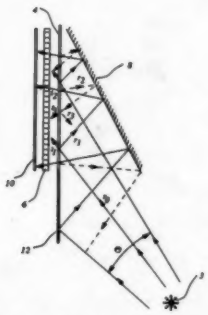
Graham L. Wright, Ickenham, England, assignor to Thorn Emi plc, London, England

Filed Nov. 25, 1991, Ser. No. 797,036

Claims priority, application United Kingdom, Nov. 30, 1990, 9026151.2

Int. Cl.[5] G02F *1/13*; G03B *21/26*

U.S. Cl. 359—70 **8 Claims**



1. Apparatus for projecting light onto a surface comprising:
a light source for providing polarised light;
beam-splitting means for effecting partial reflection and partial transmission of light incident thereon from the light source;
reflector means for reflecting light incident thereon from the light source;
mirror means for directing towards the beam-splitting means light reflected from the beam-splitting means and also light reflected from the reflector means;
and louvre means located on a side of the beam-splitting means remote from the light source for allowing the passage of light therethrough in a predetermined range of incident angles relative to the beam-splitting means.

5,184,239

SEALING STRUCTURE OF LIQUID CRYSTAL INJECTION HOLES IN LIQUID CRYSTAL DISPLAY DEVICE

Kazuyoshi Sano, Ebina; Koh Fujimura, Hino; Takumi Suzuki, and Takashi Tsutsui, both of Atsugi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

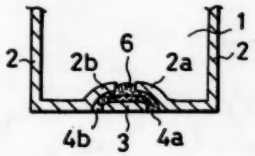
Filed Aug. 9, 1991, Ser. No. 743,076

Claims priority, application Japan, Aug. 10, 1990, 2-210260

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—80 **7 Claims**

1. A sealing structure of liquid crystal injection holes in a liquid crystal display device, comprising:
a plurality of liquid crystal injection holes formed by printing a sealant on a substrate for injecting a liquid crystal into a liquid crystal cell inside enclosed by the sealant;
a drain formed by printing the sealant on the substrate, by which a plurality of said liquid crystal injection holes communicate with each other;
at least one opening portion formed by printing the sealant on the substrate, by which said drain communicates with said cell inside, said opening portion communicating with a plurality of said injection holes by said drain; and



a sealing agent injected from one of said injection holes after said injecting of the liquid crystal for sealing a plurality of said injection holes and said drain.

5,184,240

DE-MULTIPLEXER

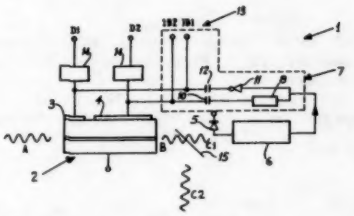
Ronan F. O'Dowd, 9 Rowan Close, Celbridge, Ireland

Filed Mar. 19, 1991, Ser. No. 671,363

Claims priority, application Ireland, Mar. 20, 1990, 1000/90

Int. Cl.[5] H04J *14/08*

U.S. Cl. 359—135 **10 Claims**



10. A de-multiplexer comprising:
an input port communicating with the cavity of a multi-region semiconductor laser amplifier device having a plurality of contacts;
monitoring means for monitoring an incoming optic signal which is time division multiplexed with at least two data channels and for extracting a clock signal;
activating means having an input connected to the monitoring means and an output connected to the contacts, the activating means comprising means for generating activating signals by splitting the clock signal and inverting a split signal, and means for delivering the activating signals to two contacts in synchronism so that each contact has an electronic response to an optic excursion in one data channel only of the optic signal; and
means for sensing electronic response in each contact.

5,184,241

DOPPLER SHIFT COMPENSATION SYSTEM FOR LASER TRANSMITTERS AND RECEIVERS

Geary K. Schwemmer, Hampstead, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Admininstration, Washington, D.C.

Filed Jun. 21, 1989, Ser. No. 369,171

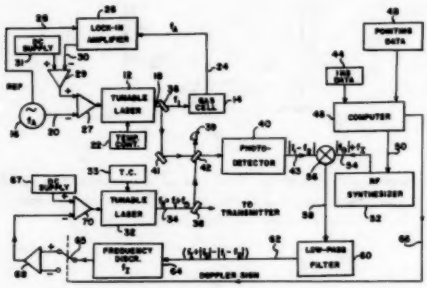
Int. Cl.[5] H04B *10/00*

U.S. Cl. 359—161 **12 Claims**

1. Apparatus for compensating for doppler shifts in optical transmission and receiving systems, including:
means for providing optical signal transmission and receiving;
means for providing a stable frequency standard;

means for computing anticipated doppler shifts between the transmission and receipt of said optical signal; and

means responsive to said frequency standard and said doppler shift computing means to provide for system doppler compensation in the form of a frequency change to either or both of said optical signal transmission and receiving means.



5,184,242

SUPERVISORY CIRCUIT FOR OPTICAL REPEATER

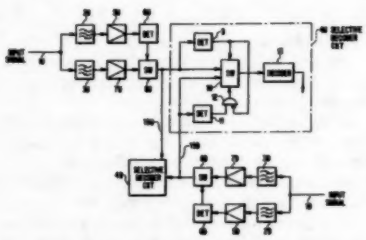
Shuji Yamashita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 17, 1990, Ser. No. 628,024

Claims priority, application Japan, Dec. 15, 1989, 1-326899

Int. Cl.[5] H04B *10/08*

U.S. Cl. 359—177 **4 Claims**



1. A supervisory circuit for an optical repeater, comprising:

separating means for separating a control signal from a transmission signal, said control signal being superposed on said transmission signal being propagated over a first channel;

detecting means responsive to said transmission signal for detecting a predetermined frequency component of noise attributed to a fault on said first channel and generating a signal indicating whether or not said noise exists on said first channel, said predetermined frequency component being different from a frequency component of said control signal;

switching means for sending in response to said signal indicating that said noise does not exist, said control signal separated by said separating means and intercepting said control signal separated by said separating means, in response to said signal indicating that said noise exists; and

selective decoding means for selecting and decoding either said control signal on said first channel fed from said switching means or another control signal fed from a second channel, depending on a combination of presence/absence of said control signals.

5,184,243

OPTICAL TRANSMITTING APPARATUS FOR MINIMAL DISPERSION ALONG AN OPTICAL FIBER

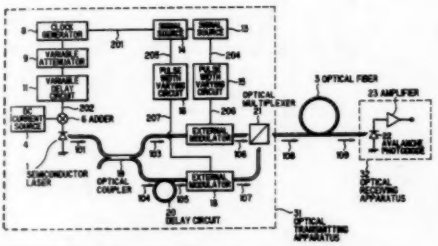
Naoya Henmi; Tetsuyuki Suzaki, and Tomoki Saito, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1990, Ser. No. 620,111

Claims priority, application Japan, Nov. 30, 1989, 1-310930; Aug. 31, 1990, 2-232218; Sep. 5, 1990, 2-234993; Sep. 5, 1990, 2-234994

Int. Cl.[5] H04B *10/04*

U.S. Cl. 359—181 **6 Claims**



1. An optical transmitting apparatus, comprising:

a semiconductor laser light source for emitting a frequency-modulated light;

a source of injection current;

a clock signal source for generating a clock signal for modulating said injection current;

means for applying said injection current to said semiconductor laser light source for modulating said emitted light in accordance with said injection current;

means for adjusting an amplitude and a phase of said clock signal to modify the modulation of said injection current;

n transmitting signal sources for generating n transmitting signals synchronous with said clock signal, where n is a positive integer;

means for dividing said frequency-modulated light into n signal lights propagated through n light paths;

n external modulators coupled to said light paths and responsive, respectively, to one of said transmitting signals, for modulating in intensity said n divided signal lights to provide n intensity-modulated lights traveling in respective ones of said n light paths;

means for providing a time difference among said n intensity-modulated lights; and

means for combining said n intensity-modulated lights traveling through said light paths;

wherein said adjusting means adjusts said amplitude and said phase of said clock signal, so that said n intensity-modulated lights are supplied to said light paths in a time-order of frequency components having slow to fast transmission speeds in compliance with a wavelength dispersion property of said light paths; and

said providing means being provided at position selected from positions between said dividing means and a corresponding one of said external modulators and between said corresponding one and said combining means.

5,184,244
OPTICAL COMMUNICATION SYSTEM AND COMMUNICATION METHOD

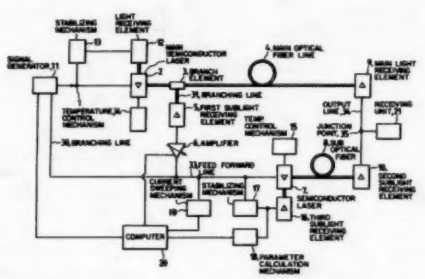
Akira Nishimura; Shuzo Suzuki, and Masayuki Shigematsu, all of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 440,247, Nov. 22, 1989, abandoned. This application Oct. 8, 1991, Ser. No. 771,838

Claims priority, application Japan, Nov. 25, 1988, 63-297486; Dec. 23, 1988, 63-325490

Int. Cl.[5] H04B *10/04*

U.S. Cl. 359—187 **8 Claims**



1. An optical communication system for directly intensity-modulating an optical signal in response to an analog signal and transmitting the intensity-modulated optical signal, said optical communication system comprising:

means for generating said analog signal;

first branching means for branching said analog signal into a first signal and a second signal;

main light emitting means for intensity-modulating an optical signal with said first signal and outputting the modulated optical signal;

second branching means for branching said modulated optical signal output by said main light emitting means into a first optical signal and a second optical signal;

first light receiving means for generating a first electrical signal in accordance with said first optical signal;

second light receiving means for generating a second electrical signal in accordance with said second optical signal;

comparison means for comparing said first electrical signal and said second signal of said analog signal, and outputting a comparison electrical signal;

auxiliary light emitting means for emitting a light in accordance with said comparison electrical signal from said comparison means;

third light receiving means for producing an electrical signal in accordance with said light from said auxiliary light emitting means;

superimposing means for superimposing the electrical signals from said second and third light receiving means; and

adjusting means connected between said auxiliary light emitting means and said analog signal generating means for calculating parameters of an input/output characteristic of said auxiliary light emitting means to adjust operating parameters in said optical communication system, said parameters being calculated via a predetermined mathematical algorithm, said adjusting means comprising:

sweep means for sweeping an input current into said auxiliary light emitting means;

fourth light receiving means for receiving said optical signal emitted from said auxiliary light emitting means and for generating a current in accordance with said optical signal; and

arithmetic operating means connected to said fourth light receiving means and said sweep means for calculating parameters of an input/output characteristic of said auxiliary light emitting means.

5,184,245
OPTICAL SCANNING SYSTEM

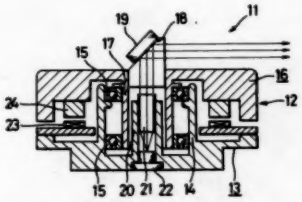
Kazunori Murakami; Tomonori Ikumi; Yasuo Matsumoto, all of Shizuoka, and Yasuo Iwafune, Tokyo, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1991, Ser. No. 680,132

Claims priority, application Japan, Apr. 3, 1990, 2-88448; Jul. 10, 1990, 2-73192[U]

Int. Cl.[5] G02B *26/08*

U.S. Cl. 359—196 **9 Claims**



7. An optical scanning system comprising:

a motor having an output shaft;

a light deflecting member attached to the output shaft of said motor;

a laser;

a collimator lens disposed between said light deflecting member and said laser having an optical axis in alignment with the optical axis of the laser;

wherein a space is formed in the output shaft of the motor with the light deflecting member attached to one end of the output shaft of the motor such that an optical path extends through the space formed in the output shaft of the motor between the laser and the light deflecting member; and

wherein said motor includes a stator having a surface which extends substantially perpendicular to an axis of rotation of said output shaft, said surface having one of a magnet and a coil thereon, said motor further including a rotor which includes a surface extending substantially perpendicular to the axis of rotation of said output shaft, wherein said rotor is connected to said output shaft, and wherein said surface of the rotor includes one of a magnet and a coil opposed to the said one of a magnet and a coil disposed on the stator to thereby produce electromechanical force for rotating said rotor and said output shaft;

said scanning system further including a support member connected to the stator and extending substantially parallel to the axis of rotation of said output shaft, said support member extending interiorly of said one of a magnet and a coil of said stator, and interiorly of said one of a magnet and a coil of said rotor, and wherein at least one bearing is provided between the output shaft and said support member such that said output shaft is supported for rotation by said support member.

5,184,246
SCANNING OF MOVING OBJECTS USING UNIQUE POLYGON MOUNTED ON CAROUSEL WHICH ROTATES AT TWICE POLYGON'S SPEED

Nira Schwartz, and Arie Shahar, both of 2800 Plaza Del Amo, Unit 187, Torrance, Calif. 90503

Filed Feb. 25, 1991, Ser. No. 660,542

Int. Cl.[5] G02B *26/10*

U.S. Cl. 359—216 **25 Claims**

22. A scanning system, comprising:

a polygon having at least one planar side mirror and an axis of rotation, said side mirror defining a plane parallel to and facing away from said axis of rotation;

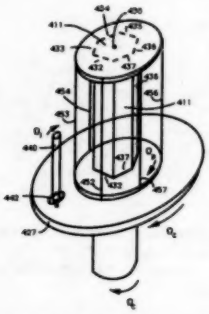
carousel means being rotatable about said axis of rotation of said polygon, said carousel means being arranged to sup-

port at least one object in a position spaced from said axis of rotation;

secondary mirror means comprising at least one secondary mirror, said secondary mirror defining a plane arranged parallel to said plane of said side mirror;

means for rotating said polygon at a first angular velocity about said axis of rotation;

means for rotating said carousel at twice said first angular velocity about said axis of rotation; and



means for directing light from a light source onto said polygon, such that light is reflected from said polygon to said secondary mirror means and thence to said object on said carousel means,

whereby when said polygon is rotated about said axis of rotation, said side mirror and said secondary mirror together behave similarly to a mirror lying in a plane including said axis of rotation.

5,184,247

OPTICALLY STABILIZED FEEDBACK AMPLIFIER

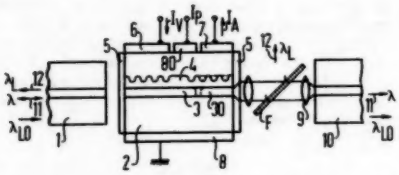
Robert Schimpe, Ottobrunn/Riemerling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 17, 1990, Ser. No. 554,270

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1989, 3923628

Int. Cl.[5] H01S *3/18, 3/133, 3/098*

U.S. Cl. 359—344 **20 Claims**



1. In an arrangement having a semiconductor laser that includes at least one optical amplification medium with maximum optical gain in laser operations at a mark wavelength λ_M, a resonator, and means for forming a wavelength filter, said means for forming a wavelength filter selecting a wavelength λ_L provided for the laser operation, the improvement comprising the means forming the wavelength filter being constructed so that the difference between the threshold gain of the resonator and the gain of the amplification medium during the laser operation is lower at the selected wavelength λ_L than at the marked wavelength λ_M and that the arrangement further includes an apparatus for the optical irradiation of the amplifying medium with at least one wavelength.

5,184,248

IMAGE PROJECTION APPARATUS

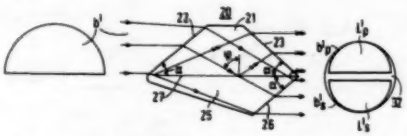
Adrianus J. S. M. de Vaan, and Adrianus H. J. van den Brandt, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 665,507, Mar. 6, 1991. This application Sep. 24, 1991, Ser. No. 764,667

Claims priority, application Netherlands, Jul. 16, 1990, 9001610

Int. Cl.[5] G02B *5/30, 27/28*

U.S. Cl. 359—483 **62 Claims**



1. An image projection apparatus comprising an illumination system, an image display system having at least one display panel for generating an image to be projected, in which the direction of polarization of an illumination beam supplied by the illumination system is modulated with the image information, a projection lens system for projecting the image formed by the image display system on a projection screen and a polarization-sensitive beam splitter arranged between the illumination system and the image display system for splitting the illumination beam into two differently polarized sub-beams the first of which is directly suitable to be modulated by the image display system and a polarization-rotating element for converting the second sub-beam into a beam having the same state of polarization as the first sub-beam, said first and second sub-beams being incident on the image display system, characterized in that the polarization-sensitive beam splitter comprises an oriented layer of birefringent material, in that the illumination beam directed towards the beam splitter has a semi-circular cross-section in a plane proximate to the beam splitter, in that the sub-beams traverse the same optical path length through the beam splitter and in that the sub-beams exiting from the combination of beam splitter and polarization-rotating element have a semi-circular cross-section and both fit within a circle.

5,184,249

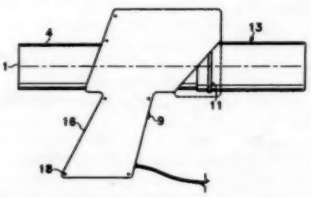
ELECTRIC KALEIDOSCOPE

Calvin H. Dickman, Rte. 4, Box 221, Harriman, Tenn. 37748

Filed Dec. 6, 1991, Ser. No. 802,828

Int. Cl.[5] G02B *23/00*

U.S. Cl. 359—616 **6 Claims**



1. An electric powered kaleidoscope for allowing a viewer to view kaleidoscopic images of objects comprising: viewing tube having front and rear ends and inner walls, mirrors in connection with said inner walls for forming and reflecting said images to said viewer, eyepiece means for allowing the passage of light in connection with said rear of said tube, objective lens at said front of said tube, end cap assembly in rotatable connection with said front end of said tube, said end cap assembly having an interior space for placing objects for

viewing and having an end cap lens located at the front of said end cap assembly, motor housing attached to said viewing tube and having an electric motor, said electric motor in mechanical connection with said end cap assembly so that the operation of said electric motor rotates said end cap assembly, said kaleidoscope having an on-off electric power switch, a detachable light and reflector assembly to provide artificial light when needed to view said images.

5,184,250

DEVICE FOR THE DISPLAY OF SIMULATED IMAGES FOR HELMETS

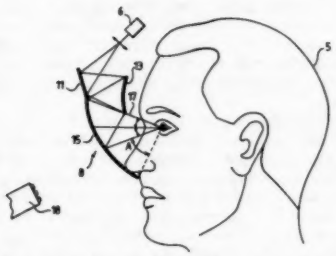
Michel Lacroix, Bois d'Arcy, France, assignor to Thomson-CSF, Puteaux, France

Filed May 31, 1991, Ser. No. 708,282

Claims priority, application France, Jun. 1, 1990, 90 06873

Int. Cl.[5] G02B *27/10, 17/00, 23/04, 23/06;* **G09B** *9/08*

U.S. Cl. 359—631 **15 Claims**



1. A device for the display of simulated images for helmets, comprising at least one device for collimation at infinity with a spherical mirror and a spherical screen fixedly joined to a helmet worn by the user, associated with a remote projector connected, firstly, by an optic fiber to an optic relay device fixed to the helmet and, secondly, to an image generator, the image generator being connected to a device for sensing the position of the head of the helmet wearer.

5,184,251

VARI-FOCAL LENS SYSTEM

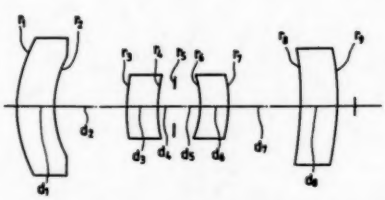
Hirofumi Tsuchida, and Norihiko Aoki, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 9, 1991, Ser. No. 697,442

Claims priority, application Japan, May 9, 1990, 2-117729

Int. Cl.[5] G02B *13/18, 15/14*

U.S. Cl. 359—654 **8 Claims**



1. A vari-focal lens system comprising, in order from the object side;

a first lens unit having a negative refractive power,

a second lens unit having a positive refractive power,

an aperture stop,

a third lens unit having a positive refractive power, and

a fourth lens unit having a negative refractive power,

wherein at least one radial type graded refractive index lens element is disposed before said aperture stop and at least one radial type graded refractive index lens element is disposed after said aperture stop, and

wherein said vari-focal lens system varies focal length thereof by varying at least an airspace disposed between said first lens unit and said second lens unit as well as an airspace disposed between said third lens unit and said fourth lens unit.

5,184,252

FINDER OPTICAL SYSTEM

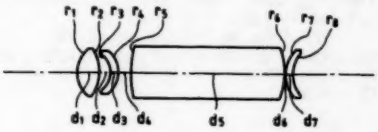
Yuji Miyauchi, Okaya; Shinichi Yoshii, Urawa, and Tatsuru Kanamori, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 4, 1991, Ser. No. 680,548

Claims priority, application Japan, Apr. 6, 1990, 2-91771; Apr. 6, 1990, 2-91772

Int. Cl.[5] G02B *13/18, 13/02, 9/12, 9/34*

U.S. Cl. 359—715 **4 Claims**



1. A finder optical system comprising: an objective including a first positive lens component and a second negative lens component, an image erecting optical system for erecting an image formed by said objective, and an eyepiece for allowing observation of the image formed by said objective and erected by said image erecting optical system; said finder optical system satisfying the following condition:

$$0.03 < |f_p/f_n| < 0.4$$

wherein the reference symbol f_p represents the focal length of said first lens component and the reference symbol f_n designates the focal length of said second lens component.

5,184,253

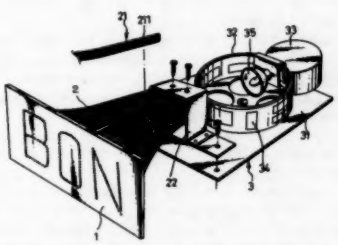
FIBER OPTIC ILLUMINATOR DISPLAY

Steven Hwang, 4F, No. 6-6, Alley 11, Lane 147, Sec. 3, Hsin Yi Rd., Taipei, Taiwan

Filed Dec. 18, 1991, Ser. No. 808,887

Int. Cl.[5] G02B *5/22*

U.S. Cl. 359—889 **1 Claim**



1. A fiber optic illuminator display, comprising:

a display board having patterns formed by holes;

a color filter light source assembly, said color filter light source assembly comprising a base board having a color filter cylinder driven to rotate by a motor, said color filter cylinder having a plurality of color filters around the cylinder, a light source on said base board inside said color filter cylinder, and an optical fiber holder on said base

board outside said color filter cylinder and in alignment with said light source;

a bunched optical fiber set connected between said holder and said display board for transmitting light rays from said light source to said patterns via said color filters; and

characterized in that said bunched optical fiber set is consisted of a plurality of bus wires attached with one above another or side by side, said bus wires each being consisted of a plurality of optical fiber filaments arranged in a row, said optical fiber filaments each having one end fastened in said holder and an opposite end respectively inserted in the holes on said diplay board.

5,184,254

PLAYBACK APPARATUS FOR PLAYING BACK VIDEO INFORMATION RECORDED ON MAGNETIC TAPE AND PROVIDING SMOOTH-FRAME STILL OR SLOW MOTION VIDEO

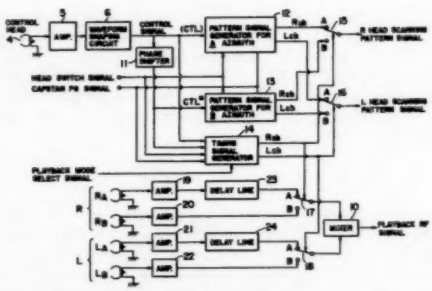
Masahiro Kaneko; Masashi Takemura, and Kohei Yamashita, all of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 20, 1990, Ser. No. 511,786

Claims priority, application Japan, Apr. 21, 1989, 1-100116

Int. Cl.[5] H04N *5/783;* **G11B** *5/592*

U.S. Cl. 360—10.2 **4 Claims**



1. A Playback apparatus for playing back information signals prerecorded on a magnetic tape along tracks inclined with respect to a longitudinal direction of said magnetic tape in a manner such that tracks of common azimuth angle are formed on every track, said apparatus comprising:

a first head assembly comprising a first head for scanning tracks of a first azimuth and a second head for scanning tracks of a second azimuth, said first head assembly being movably arranged in a direction perpendicular to a track scanning direction;

a second head assembly comprising a third head for scanning tracks of said first azimuth and a fourth head for scanning tracks of said second azimuth, said second head assembly being arranged movably in a direction perpendicular to a track scanning direction;

a rotary drum for carrying said first and second head assemblies and winding said magnetic tape at a predetermined angular range;

first displacement means for supporting and displacing said first head assembly in accordance with a selected tape speed mode, and for causing each of the heads in the first head assembly to scan said tracks having azimuth angles common to azimuth angles of said heads, when a recorded image signal on said tape is played back from said magnetic tape; and

second displacement means for supporting and displacing said second head assembly in accordance with a selected tap speed mode, said second displacement means being disposed 180 degrees angularly opposite to said first displacement means and for causing each of the heads in the second head assembly to scan said tracks having azimuth angles common to azimuth angles of said heads, when a recorded image signal on said magnetic tap is played back from said magnetic tape:

wherein said first to fourth heads are arranged on an outer circumference of said rotary drum in the order of the first, second, third and fourth heads: and

wherein control means is provided for controlling displacement of said first and second head assemblies, and said control means comprises:

a waveform shaping circuit for shaping a waveform of a control signal recorded along said magnetic tape and picked up by a control head,

a phase-shifter for phase-shifting said control signal by a phase angle of 180 degrees to generate a phase-shifted control signal,

first pattern generating means for generating a first head scanning pattern signal for controlling the first and third heads and which drives said first and second displacement means in response to said control signal for tracking said tracks of said first azimuth,

second pattern signal generating means for generating a second head scanning pattern signal for controlling the second and fourth heads which drives said first and second displacement means in response to said phase-shifted control signal for tracking said tracks of said second azimuth,

switching means for switching playback signals from said first head and said second head of said first head assembly, so that output from only one of said first and second heads is used at one time and for switching playback signals from said third head and said fourth head of said second head assembly, so that output from only one of said third and fourth heads is used at one time in order to produce a video signal corresponding to said selected tape speed mode.

5,184,255

VIDEO TAPE CASSETTE WITH A REUSABLE RECORDING ENABLE/DISABLE SLIDE TAB

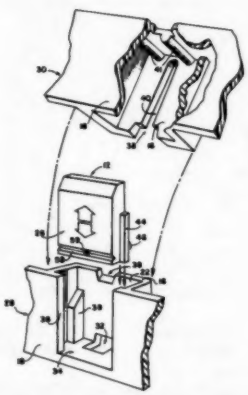
Alan B. Lowry, Canton, Mass.; Paul J. Gelardi, Cape Porpoise, Me., and Donald R. Rochelo, Pittsfield, Mass., assignors to Shape Inc., Biddleford, Me.

Filed Jan. 16, 1987, Ser. No. 3,761

The portion of the term of this patent subsequent to Oct. 2, 2006, has been disclaimed.

Int. Cl.[5] G11B *15/04, 23/02*

U.S. Cl. 360—60 **27 Claims**



1. A write-enable indicator for a tape cassette having a tape cassette housing with a top cover shell half and a lower base shell half, the tape cassette housing forming an elongated front

surface through which the tape contained by the tape cassette housing is accessed, an elongated rear surface opposite the front surface, side surfaces, and top and bottom surfaces, the write enable indicator comprising:

(a) movable means for enabling recording of a signal on the tape when said movable means is in a first position and for disabling the recording of a signal on the tape when said movable means is in a second position;

(b) retaining means for retaining said movable means in the first and second positions and for permitting said movable means to repeatedly move between the first and second positions in response to an external force,

wherein said movable means includes

sliding means for moving between the first and second positions along a first axis; and

movement retarding means for retarding the movement of said sliding means, said movement retarding means cooperating with said retaining means to prevent said sliding means from moving from the first and second positions except when the external force is applied;

wherein said retaining means includes

a first wall of the tape cassette housing, said first wall having a first surface; and

a second wall of the tape cassette housing, having a second surface facing the first surface of the first wall to form a cavity therebetween,

wherein said sliding means moves between the first and second positions by sliding between the first and second surfaces,

wherein the movable means and retaining means are located in the rear surface of the cassette housing,

wherein the movable means is movable along a first axis in the transverse direction on the tape cassette housing rear surface between the first enabling position and the second disabling position,

wherein said movement retarding means exerts an internal force along a second axis different from the first axis to produce friction between said retaining means and said sliding means at least when said sliding means is in the first and second positions,

wherein the first surface of the first wall includes two depressions separated along the first axis, and

wherein said movement retarding means comprises a flexible member having a first end attached to said sliding means and a second end projecting into the first and second depressions when said sliding means is in the first and second positions, respectively.

5,184,256

WRITE-DATA SIGNAL COMPENSATION APPARATUS FOR DISK STORAGE

Eiji Chikusa, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jun. 8, 1990, Ser. No. 540,925

Claims priority, application Japan, Jun. 16, 1989, 1-153681

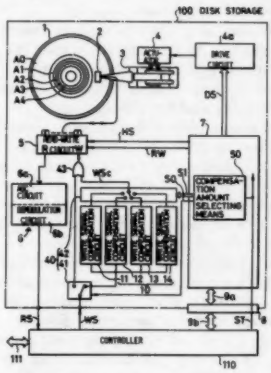
Int. Cl.[5] G11B *5/09*

U.S. Cl. 360—65 **10 Claims**

1. A write-data signal compensation apparatus for disk storage for modifying a first write signal having a particular modulation data pattern into a second write signal having a data pattern expedient to be read out from a disk before the second write signal is written to the disk by a write head, said write-data signal compensation apparatus comprising:

write signal compensation means for converting said first write signal into said second write signal by using a plurality of different compensation amounts, said write signal compensation means including a plurality of write compensation circuits, each of said write compensation circuits having an input to which said first write signal is applied and an output from which said second write signal is produced, each of said write compensation circuits changing transition points of pulses of said first write signal so as to compensate pulse widths of the pulses of said first write signal by predetermined amounts to obtain said second write signal, pulse rates of the pulses of said first write signal and said second write signal being maintained at the same rate;

compensation amount selecting means for selecting one of said plurality of different compensation amounts according to the radial position of said write head on said disk; and



compensation amount switching means for switching inputs and/or outputs of said write signal compensation means in response to the output of said compensation amount selecting means.

5,184,257

HEAD POSITIONING CONTROL FOR A SPINDLE MOTOR DISK DRIVE

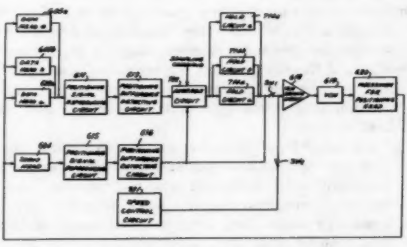
Yoshiro Koga; Akihiro Gomi; Takashi Miyasaka; Yasunaga Miyazawa; Kenichi Endo; Junichiro Shinozaki; Kaneo Yoda; Takashi Ichikawa; Hitoshi Miyasaka, and Chiharu Kaburagi, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 643,243, Feb. 8, 1991, abandoned, which is a division of Ser. No. 481,755, Feb. 15, 1990, Pat. No. 5,023,733, which is a continuation of Ser. No. 107,722, Oct. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 93,201, Dec. 15, 1986, abandoned. This application Dec. 6, 1991, Ser. No. 807,767

Claims priority, application Japan, Dec. 16, 1985, 60-282189; Dec. 19, 1985, 60-286431; Feb. 21, 1986, 61-36778; Feb. 25, 1986, 61-39732; Apr. 2, 1986, 61-75903; Apr. 28, 1986, 61-99816; May 7, 1986, 61-104161; Jun. 30, 1986, 61-153006; Oct. 7, 1986, 61-238269; Oct. 8, 1986, 61-239602; Oct. 8, 1986, 61-239603; Oct. 8, 1986, 61-239604; Oct. 21, 1986, 61-238270; Oct. 21, 1986, 61-250066; Nov. 25, 1986, 61-280319; Nov. 25, 1986, 61-280320

Int. Cl.[5] G11B *5/596*

U.S. Cl. 360—77.05 **29 Claims**



1. A magnetic recording device comprising:

a spindle;

at least one magnetic disk mounted in spaced relationship along the spindle, a plurality of tracks formed on said at least one magnetic disk;

head means for recording and reproducing data on said at least one magnetic disk;

actuator means for moving the head means to selected tracks on said at least one magnetic disk;

first positioning means providing first positioning data for positioning said head means; the at least one magnetic disk being formed with at least one data surface, second positioning data being formed on the at least one data surface for positioning said head means; and

control means coupled to the actuator means for controlling the positioning of the head means in response to the first and second positioning data, said head means including a plurality of data heads, the control means being adapted to position each data head by superimposing second positioning information derived from the second positioning data on first positioning information derived from said first positioning data; said control means including adding means for superimposing the second positioning information on the first positioning information; the control means being adapted to add the second positioning information gradually to the first positioning information prior to the settling of the first positioning means to a destination track.

5,184,258

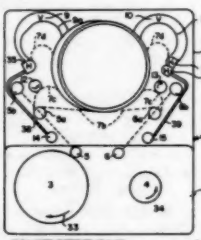
HELICAL SCAN MAGNETIC TAPE RECORDER WITH CAPSTAN ASSISTED VACUUM THREADING

Frederic F. Grant, Bellflower; Vincent J. Piarulli, Simi Valley, both of Calif.; Alexander R. Maxey, Eugene, Oreg., Robert Ryerson, San Gabriel, Calif., assignors to Datatape Incorporated, Pasadena, Calif.

Filed Jun. 10, 1991, Ser. No. 712,834

Int. Cl.[5] G11B *15/60*

U.S. Cl. 360—85 **3 Claims**



1. A helical scan magnetic tape recorder comprising:

a rotary magnetic head scanner;

supply and take-up vacuum cavities located contiguous to and on respective opposite sides of said scanner;

means for receiving a magnetic tape cassette including spaced, coplanar, supply and take-up reels having magnetic tape spooled on said reels with a span of magnetic tape extending between said reels;

supply and take-up capstans, spaced from said rotary head scanner and located in a tape transport path between said vacuum cavities and a received magnetic tape cassette;

mechanical threading means for removing said tape from said cassette and moving it to a tape vacuum loading position where said tape partially contacts said rotary head scanner;

vacuum means for applying vacuum to said vacuum cavities, after said tape has been moved to said tape vacuum loading position, to draw said tape into contact with said vacuum cavities on opposite sides of said rotary head scanner to substantially wrap said tape around said rotary head scanner; and

wherein said supply and take-up capstans contact said tape during said vacuum threading and are rotated to assist drawing said tape into said vacuum cavities.

5,184,259

HELICAL-SCAN MAGNETIC TAPE APPARATUS HAVING A TAPE-TRANSPORT PATH WITH TWISTING PATH-SECTIONS FOR TAPE-PATH CORRECTION

Johannes C. A. Muller, and Norbert C. Vollmann, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

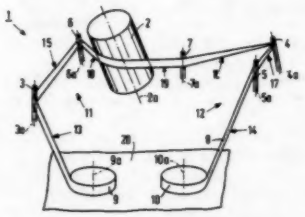
Continuation of Ser. No. 368,733, Jun. 20, 1989, abandoned.

This application Jul. 19, 1991, Ser. No. 732,946

Claims priority, application Netherlands, Jul. 5, 1988, 8801699

Int. Cl.[5] G11B *5/027*

U.S. Cl. 360—85 **8 Claims**



1. A helical-scan magnetic-tape apparatus (1) comprising at least three tape guides (2, 3, 4) having axes (2*a*, 3*a*, 4*a*), and including a magnetic-head unit (2), which also serves as one of said tape guides, at least two of said guides also acting as tape-threading elements (3, 4) which are movable between a first position, corresponding to a non-operational situation in which the magnetic tape (8) is not in contact with the tape guides (2, 3, 4), and a second position, corresponding to an operational situation in which the magnetic tape (8) is in contact with the tape guides (2, 3, 4), which apparatus (1) is constructed to cooperate with a magnetic tape (8) which is is wound on first and second co-planar reels (9, 10), which each have an axis (92, 102) and extends between said first reel (9) and said second reel (10) in the operational situation, a first branch (11) being provided between the first reel (9) and the magnetic-head unit (2) and a second branch (12) being provided between the second reel (10) and the magnetic-head unit (2), each branch (11, 12) including at least one tape guide (3, 4), a first path section (13) being provided between said first reel (9) and the tape guide (3) nearest said first reel, viewed in the direction of tape transport, a second path section (14) being provided between said second reel (10) and the nearest tape guide (4), viewed in the direction of tape transport, and further path sections (15, 16) being provided between two tape guides situated one after the other viewed in the direction of tape transport, both the first and second path section (13, 14) being disposed in the same plane (20) as the reels (9, 10), wherein:

at least three path sections (14, 15, 16) of the tape (8) are twisted by one of:

the axes of two adjacent tape guides, and the axes of a reel and an adjacent tape guide, between which a twisting tape path sections extends,

the first branch (11) includes at least one of said path sections; (15) and

the second branch (12) includes at least two of said path sections (14, 16) in which the tape path (8) is twisted, at least two twisted path sections within a given branch being nonparallel.

5,184,260

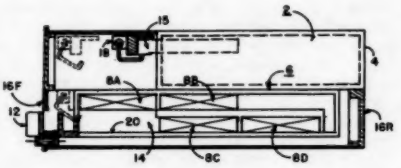
MAGNETIC TAPE DRIVE WITH INTEGRAL MULTIPLE-CASSETTE REMOVABLE MAGAZINE

Michel A. Pierrat, Boulder, Colo., assignor to Ency Nova Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 555,576, Jul. 10, 1990, abandoned, and a continuation-in-part of Ser. No. 679,910, Apr. 3, 1991, abandoned. This application Jul. 9, 1991, Ser. No. 727,647

Int. Cl.[5] G11B *15/68*

U.S. Cl. 360—92 **37 Claims**



1. Apparatus for storing and manipulating cassettes having a magazine for storing cassettes comprising

a first deck including means for supporting a plurality of cassettes in a first plane and having a designated cassette pick-up position,

a second deck including means for supporting a plurality of cassettes in a second plane parallel with and displaced from said first plane,

first reciprocating cassette drive means for moving each of said cassettes in said first deck in a first direction and simultaneously moving each of the cassettes in said second deck in the opposite direction including means for transferring said cassettes between said decks, whereby said cassettes are caused to successively be positioned in said pick-up position, and

robot arm means for removing one of said cassettes from and replacing it in said pick-up position.

5,184,261

VARIOUS-SIZED-CASSETTE HOUSING SHELF

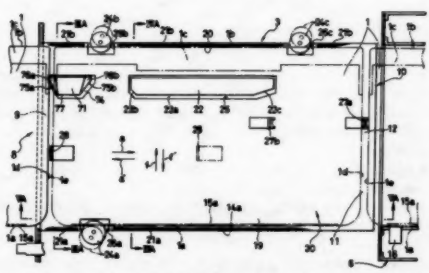
Hideaki Noguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 26, 1991, Ser. No. 674,980

Claims priority, application Japan, Mar. 28, 1990, 2-079974; Mar. 28, 1990, 2-079975; Mar. 28, 1990, 2-079977

Int. Cl.[5] G11B *15/68*

U.S. Cl. 360—94 **4 Claims**



1. A cassette housing shelf for selectively accommodating relatively large-sized and small-sized cassettes which respectively have relatively large and small widths, comprising: a horizontal shelf-plate having a cassette-bearing surface with parallel opposite side margins; upstanding side walls extending from said side margins of the shelf plate and between which a cassette-receiving space is defined above said cassette-bearing surface with an inlet at one end of said shelf plate, said side walls being spaced apart by a distance approximately equal to said relatively large width of the large-sized cassette so that the latter is laterally guided by said side walls when inserted through said inlet into said cassette-receiving space; an elongated guiding element extending generally parallel to said side walls and being movable between a raised operative position above said cassette-bearing surface and a depressed inoperative position submerged relative to said cassette-bearing surface, said guiding element in said operative position being spaced from one of said side walls by a distance approximately equal to said relatively small width of the small-sized cassette so that the latter can be laterally guided between said guiding element and said one side wall when said small-sized cassette is inserted through said inlet into said cassette-receiving space; first and second sensing elements disposed adjacent said inlet at said one side wall and the other of said side walls, respectively, and being movable independently of each other between inner positions where said sensing elements project beyond said side walls at least partly into said cassette-receiving space and outer positions withdrawn from said space; means yieldably urging said sensing elements to said inner positions thereof; means responsive to movement of said second sensing element to said inner position thereof for urging said guiding element to said raised operative position and for permitting said guiding element to move to said depressed inoperative position when said second sensing element is moved to said outer position thereof; means engageable with said guiding element for blocking movement of the latter to said depressed inoperative position; and means responsive to movement of said first sensing element from said inner position to said outer position thereof for disengaging from said guiding element said means for blocking movement of the latter to said depressed inoperative position so that said guiding element is thereby permitted to move to said depressed inoperative position only when a large-sized cassette, in being inserted through said inlet into said cassette-receiving space, simultaneously displaces said first and second sensing elements to said outer positions thereof.

5,184,262

DUAL MOTOR MODE SWITCHING MECHANISM FOR A RECORDING AND/OR REPRODUCING APPARATUS

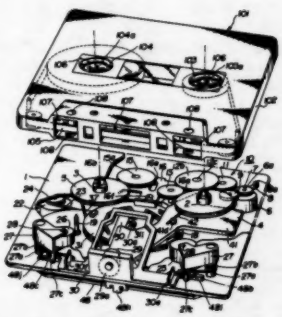
Hisanori Watanabe, Kanagawa, and Shinji Ito, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 512,987

Claims priority, application Japan, Apr. 27, 1989, 1-108773

Int. Cl.[5] G11B *5/008*

U.S. Cl. 360—96.2 **11 Claims**



1. A mode switching mechanism in an apparatus for recording and/or reproducing signals from or onto tape wound on a supply reel and a take up reel, the mechanism comprising

capstan means for transporting the tape;

a capstan motor for rotationally driving the capstan means;

a pair of reel gears for driving the supply and take up reels;

a reel motor for selectively driving the reel gears, the reel motor being rotatable in either direction;

transmission gear means for transmitting drive power of the reel motor;

movable swing arm means for rotatably supporting the transmission gear means, the movable swing arm means being movable selectively in a first direction and in a second direction in dependence upon the rotational direction of the reel motor;

intermediate gear means for selectively transmitting the drive power from the transmission gear means to the reel gears;

drive gear means rotationally driven by the capstan motor;

cam gear means having a peripheral gear section inclusive of interrupted portions and also having a cam surface section, a triggered section and a retained portion on a major planar surface, the cam gear means being rotationally driven in one direction by means of the gear section by the drive gear means;

mode switching means for selectively switching and setting a plurality of operational modes by the cam surface section in dependence upon a rotational angular position of the cam gear means;

cam gear retention means having a retainer for retaining the retained portion of the cam gear means and being movably supported between a first position in which the retainer retains the retained portion and the rotational angular position of the cam gear means is set to a position in which the interrupted portions face the drive gear means and a second position of releasing retention between the retainer and the retained portion; and

trigger means for thrusting the triggered section for rotationally biasing the cam gear means in one direction;

wherein the reel motor can be rotationally driven in a forward direction to shift the movable swing arm means in the first direction for rotationally driving the reel gears, and

the reel motor can be rotationally driven in a reverse direction for shifting the movable swing arm means in the second direction, the cam gear retention means being moved from the first position to the second position to release retention between the retainer and the retained portion, and the cam gear means being rotationally driven for driving the mode switching means for switching operational modes.

5,184,263

LOADING METHOD AND DRIVE UNIT FOR A FLOATING MAGNETIC HEAD FOR LOADING THE MAGNETIC HEAD WHILE PREVENTING CONTACT BETWEEN THE MAGNETIC HEAD AND A MAGNETIC DISK

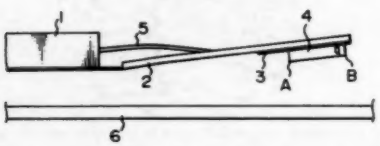
Masaharu Fukakusa, and Hiroshi Tomiyasu, both of Kumamoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 8, 1990, Ser. No. 610,576

Claims priority, application Japan, Nov. 14, 1989, 1-295852

Int. Cl.[5] G11B *5/54, 5/60, 21/12, 21/21*

U.S. Cl. 360—103 **5 Claims**



3. A magnetic disk drive unit, comprising:

a magnetic disk having at least one recording surface;

an arm supported for movement along said recording surface of said magnetic disk;

a flexure member mounted on said arm;

a magnetic head having a floating surface and mounted on said flexure member by a gimbal means, said magnetic disk being adapted for movement relative to said magnetic head in a movement direction from an upstream end to a downstream end of the magnetic head to induce an air flow which travels along the floating surface of the magnetic head in a direction from the upstream end to the downstream end of the magnetic head such that the magnetic head tends to float above the magnetic disk in said air flow, said magnetic head being positioned by said flexure member initially in a parked position such that said upstream end of the magnetic head is closer to said recording surface of the magnetic disk than is the downstream end of the magnetic head; and

a pressing member for moving said flexure member to move said magnetic head toward a loaded position by causing said magnetic head to move through a position at which the upstream end and the downstream end of the magnetic head are equally spaced from the recording medium and a position at which the downstream end of the magnetic head is closer to the recording medium than is the upstream end of the magnetic head so as to thereafter approach said recording surface of the magnetic disk with the downstream end of the magnetic head being closer to said recording medium than is said upstream end of said magnetic head and to move toward the magnetic disk until a gap between the magnetic head and the recording surface of the magnetic disk has a predetermined magnitude.

5,184,264

ADJUSTABLY MOUNTED AUDIO CONTROL HEAD

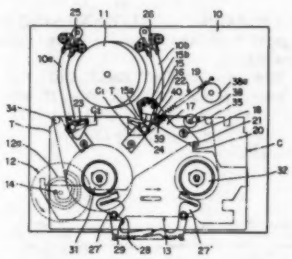
Bo H. Choi, Kyungki, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 413,217, Sep. 27, 1989, abandoned. This application Nov. 12, 1991, Ser. No. 794,804

Claims priority, application Rep. of Korea, Sep. 30, 1988, 12863

Int. Cl.[5] G11B *5/54*

U.S. Cl. 360—105 **3 Claims**



1. A high speed searching device in a video cassette tape recorder including tape loading assemblies for drawing a magnetic tape out of a cassette and around a rotatable head drum into a magnetic tape playback location comprising

a base plate;

a connecting plate movably mounted on said base plate, means for moving said connecting plate,

a head lever rotatably mounted on said base plate and supporting an audio and control head assembly at one end thereof,

means for positioning said audio and control head assembly selectively in a high speed searching position or in a play back portion,

said means for positioning said audio and control head assembly in a high speed searching position including means for swinging said audio and control head assembly toward a middle pocket of a tape cassette by the rotation of said head lever in response to movement of said connecting

plate, so that in the high speed searching position the audio and control head assembly acts on the tape within the body of the cassette and without the tape being withdrawn from the cassette, and

said means for swinging said audio and control head assembly including an interlocking pin carried by said head lever and engaging an interlocking ridge portion of said connecting plate.

5,184,265

MAGNETIC HEAD SUSPENSION ASSEMBLY IN A DISK DRIVE

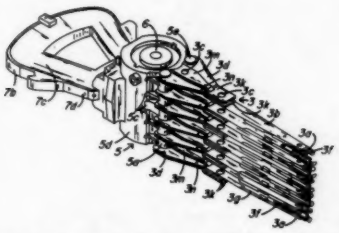
Wayne E. Foote, Eagle; Paul K. Mui, Boise, and Roger R. Sleger, Meridian, all of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 434,749, Nov. 13, 1989, abandoned. This application Jun. 10, 1991, Ser. No. 713,621

The portion of the term of this patent subsequent to Feb. 19, 2008, has been disclaimed.

Int. Cl.[5] G11B *5/55, 5/48, 33/14*

U.S. Cl. 360—106 **10 Claims**



1. A low inertia magnetic head suspension assembly for a magnetic disk memory drive, having at least one magnetizable memory disk, comprising:

an elongated load beam having first and second ends, said load beam being of resilient stainless steel sheet metal having a predetermined thickness;

a magnetic head resiliently mounted on said first end of said load beam;

an arm of stainless steel sheet metal of a predetermined thickness, having first and second ends and having a thermal expansion coefficient substantially the same as that of said load beam and of a cross-sectional configuration to provide structural rigidity;

said second end of said load beam being welded directly to said first end of said arm;

actuator means having a thermal coefficient of expansion substantially the same as that of said load beam;

said second end of said arm being attached directly to said actuator means with said magnetic head on the first end of said load beam positioned adjacent one surface of said memory disk.

5,184,266

METAL-IN-GAP HEAD WITH DOUBLE METAL LAYER

Yasushi Kanai; Hiroe Takano, both of Nagaoka; Shushi Saoshita, Toyama, and Atsumi Nitta, Nagaoka, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

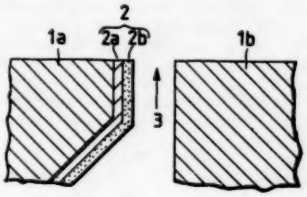
Filed Apr. 17, 1991, Ser. No. 686,733

Claims priority, application Japan, Apr. 23, 1990, 2-107143

Int. Cl.[5] G11B *5/235*

U.S. Cl. 360—120 **4 Claims**

1. A magnetic head of the metal-in-gap type having a metal layer in a magnetic gap formed in a magnetic core, the metal layer comprising a magnetic metal, wherein the metal layer comprises a plurality of thin film layers, each of the thin film layers comprised of a material having a saturation magnetic flux density higher than the saturation magnetic flux density of the magnetic core, and the material constituting the thin film layer located nearer to the magnetic gap is higher in saturation



magnetic flux density than the material constituting the thin film layer farther from the magnetic gap.

5,184,267

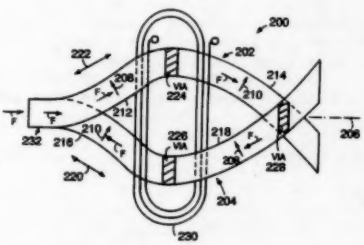
TRANSDUCER WITH IMPROVED INDUCTIVE COUPLING

Micheal L. Mallary, Berlin, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 360,334, Jun. 2, 1989, abandoned. This application Oct. 25, 1990, Ser. No. 603,162

Int. Cl.[5] G11B *5/147, 5/17;* B32B *9/00*

U.S. Cl. 360—126 **43 Claims**



16. A thin film magnetic transducer comprising

a yoke having a plurality of planar arms extending generally along a first direction and laterally spaced from each other over a majority of their lengths In a direction generally parallel to the planes of said arms, said arms being connected together by a portion extending generally parallel to said planes and which is short relative to said lengths of said arms, said arms each having an easy axis of magnetization oriented transverse to said first direction so that flux will conduct through said arms predominantly by rotation rather than by wall motion,

at least said transverse portion of said yoke including a plurality of layers having different easy axes of magnetization at least one of which is transverse to the direction of flux conduction in said portion to reduce the amount of flux conduction that occurs by wall motion therein, and

a coil having at least one turn, said yoke and said coil being intertwined to provide at least two flux interactions between said yoke and said at least one turn.

5,184,268

MAGNETIC TAPE CASSETTE

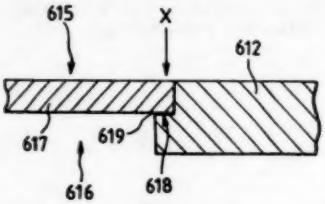
Masato Mizuno, and Kengo Oishi, both Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 799,204, Nov. 27, 1991, which is a division of Ser. No. 697,560, May 9, 1991, Pat. No. 5,101,307, which is a division of Ser. No. 323,926, Mar. 15, 1989, Pat. No. 5,041,938. This application May 28, 1992, Ser. No. 889,244

Claims priority, application Japan, Mar. 15, 1988, 63-33175; Mar. 15, 1988, 63-33176; Mar. 22, 1988, 63-36416; Apr. 1, 1988, 63-42993; Apr. 7, 1988, 63-46184; Apr. 7, 1988, 63-46185; Apr. 18, 1988, 63-50834

Int. Cl.[5] G11B *23/087*

U.S. Cl. 360—132 4 Claims



1. In a magnetic tape cassette comprising upper and lower cassette halves defining a hollow cassette case within which a magnetic tape, wound on a pair of hubs, is mounted so that the magnetic tape can run, the upper cassette half having a transparent window at an upper wall thereof, the improvement wherein the transparent window comprises a transparent synthetic resin plate sealing an opening formed through an upper wall of the upper cassette half, the synthetic resin plate being bonded to an edge portion of the opening by an ultraviolet-cured resin formed therebetween.

5,184,269

OVERLOAD PROTECTIVE DEVICE

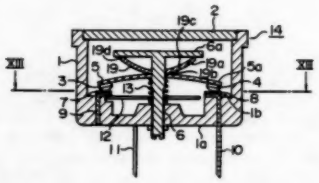
Toshio Shimada, Tochigi; Morio Kobayashi, Oyama; Takemi Tada, and Shigeya Kawaminami, both of Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1991, Ser. No. 682,264

Claims priority, application Japan, Apr. 6, 1990, 2-090324; Aug. 6, 1990, 2-206758; Aug. 29, 1990, 2-225051

Int. Cl.[5] H02H *5/04, 7/08*

U.S. Cl. 361—24 22 Claims



1. An overload protective device to be disposed in an electric circuit serving to supply current to a load, said device comprising:

a case;

a pair of fixed terminals each having a fixed contact inside of said case;

a shaft extending in said case with one end thereof fixed to said case and the other end thereof constituting a free end formed with a head portion of a diameter greater than that of said shaft;

an inversible disk-like bimetal of curved shape having formed in a central portion thereof a hole through which said shaft extends and movable contacts capable of coming in contact with said fixed contacts respectively; and

elastic means serving to resiliently bias said bimetal toward said head portion,

wherein a thermoactive disk member of a curved shape is disposed between said head portion and said bimetal and movable in response to heat from a first position where said thermoactive member is in contact with said head portion at a peripheral edge portion of said thermoactive member with a central portion thereof projecting against said bimetal to urge said bimetal against a force of said elastic means, to a second position where the central portion of said thermoactive member projects against said head portion to release at least a part of a force of said elastic means, thereby breaking said electric circuit permanently.

5,184,270

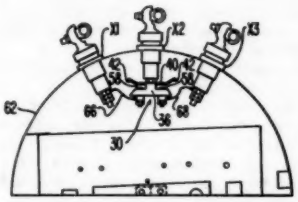
INTERNAL ARC GAP FOR SECONDARY SIDE SURGE PROTECTION AND DISSIPATION OF A GENERATED ARC

Edward L. Boyd; E. R. Eley, both of Athens, Ga., and Jeewan L. Puri, Venetia, Pa., assignors to ABB Power T&D Company, Inc., Blue Bell, Pa.

Continuation-in-part of Ser. No. 538,035, Jun. 13, 1990. This application May 8, 1991, Ser. No. 696,969

Int. Cl.[5] H02H *7/04*

U.S. Cl. 361—35 23 Claims



1. A system for protecting the primary windings of a distribution transformer from surge currents which exceed a predetermined level, said system comprising:

a tank for accommodating the transformer, said tank including a gas space therein;

a first expanding arc gap extending between a first terminal and a second terminal on a secondary side of the transformer; and

a second expanding arc gap extending between a third terminal and said second terminal on the secondary side of the transformer,

wherein said first and second arc gaps are positioned in and exposed to said gas space of said tank such that a surge current which exceeds said predetermined level will bypass secondary windings of the transformer.

5,184,271

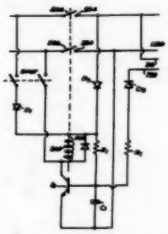
SHOCK HAZARD PROTECTION SYSTEM

Richard C. Doyle, Greenlawn, and Lester Rivera, Glendale, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Continuation of Ser. No. 654,715, Apr. 1, 1991, abandoned, which is a continuation of Ser. No. 544,769, Jun. 27, 1990, abandoned, which is a continuation of Ser. No. 416,618, Oct. 3, 1989, abandoned, which is a continuation of Ser. No. 323,451, Mar. 14, 1989, abandoned, which is a continuation of Ser. No. 177,726, Apr. 5, 1988, abandoned, which is a continuation of Ser. No. 2,833, Jan. 9, 1987, abandoned, which is a continuation of Ser. No. 885,114, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 558,262, Dec. 5, 1983, abandoned. This application Dec. 23, 1991, Ser. No. 814,304

Int. Cl.[5] H02H *3/16*

U.S. Cl. 361—49 **5 Claims**



1. In combination with a load operatively connected to a source immersion detecting means, said immersion detection means comprising a first conductor situated within said load and connected to a phase line of an A–C source and a second conductor being situated within said load and spaced apart from said first conductor, for detecting a water-related shock hazard condition contained within said load, and conducting means connected to said immersion detecting means, circuit interrupting means comprising:

a pair of first and second contacts supported for engagement and disengagement with respect to one another,

a coil electrically connected to said immersion detecting means via said conducting means, comprising a third conductor directly connected to said second conductor and a diode, a resistor and a transistor connected in series with each other and in-line with said third conductor, said transistor operating to cut off current to said coil and disengage said first and second contacts when a water-related shock hazard condition is detected,

a magnetizable plunger member having portions thereof disposed within said coil and movable in response to energization of said coil,

means for defining a path of a magnetic field generated by said coil, and

latch means manually operable to move said plunger to bring said first and second contacts into engagement with each other.

5,184,272

HIGH-SIDE SWITCH WITH OVERCURRENT PROTECTING CIRCUIT

Koichi Suda, Hitachi; Hitoshi Matsuzaki, Mito; Masayuki Wada, Katsuta, and Shoichi Ozeki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Haramachi Semi-Conductor Ltd., Hitachi, both of, Japan

Filed Mar. 29, 1990, Ser. No. 500,881

Claims priority, application Japan, Mar. 31, 1989, 1-78247; Jul. 5, 1989, 1-171803

Int. Cl.[5] H02H *3/18*

U.S. Cl. 361—87 **14 Claims**

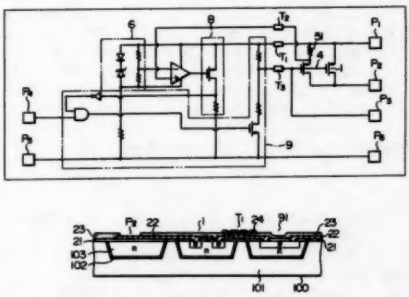
4. A switching circuit comprising:

a main P-channel MOSFET turned on or off in accordance with an external control signal, the source and drain of the main P-channel MOSFET being connected to the positive terminal of a D.C. power source and a load, respectively;

a bypass P-channel MOSFET connected between the source and drain of the main P-channel MOSFET, the bypass P-channel MOSFET being turned on or off in accordance with the external control signal, the bypass P-channel MOSFET being smaller in current capacity than the main P-channel MOSFET;

detection means for detecting a voltage indicative of current value flowing through the bypass P-channel MOSFET;

reference-voltage generating means connected to the positive terminal of the D.C. power source for generating a reference voltage having a constant value independently of variations in output voltage of the D.C. power source, wherein the reference voltage generating means includes a series combination of a diode, a Zener diode and a first resistor, a Zener diode connected between the base and collector of the bipolar transistor, a series combination of second and third resistors, and a fourth resistor connected between the base and emitter of the bipolar transistor, the series combination of the bipolar transistor and the first resistor is connected between the positive and negative terminals of the D.C. power source, the series combination of the second and third resistors is connected between the emitter and collector of the bipolar transistor, and the connecting point of the second and third resistors is used as an output terminal of the reference-voltage generating means;



comparator means for comparing a detected voltage from the detection means with the reference voltage from the reference-voltage generating means, to convert the detected voltage into a logic voltage, the comparator means being operated on a supply voltage which is a floating voltage dependent upon the supply potential of the D.C. power source;

conversion means for converting the logic voltage from the comparator means into a voltage measured from a ground potential; and

control means for exerting ON-OFF control over the external control signal which is supplied to the main P-channel MOSFET and the bypass P-channel MOSFET, in accordance with the output of the conversion means.

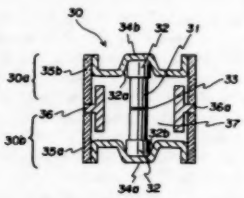
6. A switching circuit according to claim 4, wherein the main P-channel MOSFET, the bypass P-channel MOSFET, the detection means, the reference-voltage generating means, the comparator means, the conversion means and the control means are formed in the same semiconductor substrate.

5,184,273

MICROGAP TYPE SURGE ABSORBER

Yoshiyuki Tanaka, and Takaaki Itoh, both of Saitama, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Nov. 26, 1991, Ser. No. 798,528
Claims priority, application Japan, Nov. 27, 1990, 2-320898
Int. Cl.[5] H01H *9/04, 9/06*
U.S. Cl. 361—120 **7 Claims**



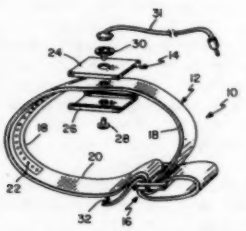
1. A microgap surge protector which comprises:
a) a wall forming a sealed chamber;
b) a rod-shaped element within the chamber formed from an electrically insulating material, said element having:
a coating thereon of an electrically conducting material, said coating having a microgap therein centered between the ends of the element;
first and second electrodes, one at each end of the element in electrically conductive contact with the coating;
(c) means for providing an electrical connection between the exterior of the chamber and the first and second electrodes;
d) a third cylindrical electrode having a hollow portion therein within the chamber and having a diameter larger than the rod-shaped element and a length greater than the width of the microgap, the rod-shaped element being aligned within the hollow portion and coaxially with the third electrode such that it is spaced apart from the interior surface of the third electrode and the microgap is positioned between the ends of the third electrode;
e) an inert gas filling the interior of the chamber.

5,184,274

ADJUSTABLE, ELASTIC STATIC CONTROL WRISTBAND

John W. Weiss, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 7, 1990, Ser. No. 579,168
Int. Cl.[5] H05F *3/00*
U.S. Cl. 361—220 **18 Claims**



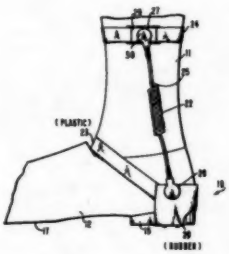
1. A device for electrically connecting an individual to a conductive grounding tether, comprising:
a first strap having an electrically conductive portion for contacting a limb of the individual, said first strap having first and second ends, and an intermediate portion;
a second strap which is elastic and electrically insulative, having first and second ends, said first end thereof being attached to said second end of said first strap;
a connector case attached to said intermediate portion of said first strap, and having connector means for electrically connecting said conductive portion of said first strap to the tether;
clasp means for adjusting the effective length of said second strap, said first end of said first strap being attached to said clasp means, and said second end of said second strap being attached to said clasp means; and
first and second straps, connector case and clasp means defining a closed loop for encircling the limb of the individual.

5,184,275

HEEL GROUNDING DEVICE

Dave C. Wiegel, Manhattan Beach; Dan A. Bradshaw, Hawthorne, and Stasys Petravicius, Ranchos Palos Verdes, all of Calif., assignors to Hughes Aircraft Company, Los Angles, Calif.

Filed Dec. 21, 1989, Ser. No. 454,814
Int. Cl.[5] H05F *3/02*
U.S. Cl. 361—223 **2 Claims**



1. An electrostatic discharge device attached to an operator communicating with an electrically conductive grounding element comprising:
partially electronically conductive element (**20**) composed of carbonized rubber material attached to the operator worn against the heel (**15**) of a shoe (**20**) of the operator;
a plurality of metal rivets (**31, 32, 33**) arranged in a triangular configuration protruding no more than 1/16 inch from said partially electronically conductive element (**20**) for discharging static electricity for the safety and comfort of the operator;
a ground lead (**25**) with a first fastener (**27**) containing an electrical resistor (**30**) therein and a second fastener (**26**), said ground lead having a coil (**22**) which can elongate or contact, and is connected to said partially conductive element (**20**) by said second fastener (**26**);
a first strap (**23**) connected to said partially conductive element (**20**), said first strap consisting of plastic material consisting of two pieces with a velcro material in a hook and pile attachment configuration; and
a second strap (**24**) made of elastic fabric attached using a metal buckle (**29**) to a leg of said operator by said first fastener (**27**) of said lead (**25**) and said partially conductive element (**20**) by way of said lead (**25**) with said second fastener (**26**).

5,184,276

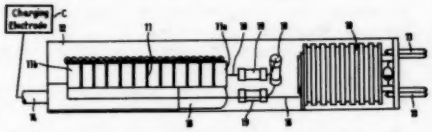
ELECTROSTATIC PAINT SPRAY GUN

Georg Simon, Altstatten, Switzerland, assignor to Wagner International AG, Switzerland

Filed Jun. 5, 1991, Ser. No. 711,170
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1990, 4020289
Int. Cl.[5] B05B *5/025*
U.S. Cl. 361—228 **11 Claims**

1. An electrostatic paint spray gun having a built-in high-voltage generator comprising a transformer and a high-voltage

cascade following thereupon and extending in a barrel of said gun, whereby a low-voltage input of said cascade is connected to an output of said transformer, a high-voltage output of said cascade is connected to a high-voltage electrode of said gun



with a stranded lead via output resistors, and said transformer and cascade are cast into an insulating member, said high-voltage cascade being arranged on a carrier tube having an annular flange with bores for the positioning of said output resistors.

5,184,277

CERAMIC CAPACITOR AND METHOD FOR FABRICATING THE SAME

Hisamitsu Shizuno; Hirosi Kisi; Hirosi Saito, and Makoto Fujii, all of Tokyo, Japan, assignors to Taiyo Yuden Kabusikigaisha, Japan

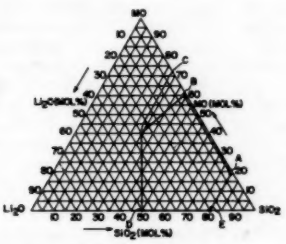
PCT No. PCT/JP91/00397, § 371 Date Oct. 17, 1991, § 102(e) Date Oct. 17, 1991, PCT Pub. No. WO91/15024, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 28, 1991, Ser. No. 768,242

Claims priority, application Japan, Mar. 28, 1990, 2-76775; Mar. 28, 1990, 2-76776

Int. Cl.[5] H01G *4/10, 7/00*

U.S. Cl. 361—321 **4 Claims**



1. A ceramic capacitor, comprising:

at least one dielectric ceramic layer of a dielectric ceramic composition and at least two internal electrodes sandwiching said dielectric ceramic composition;

said dielectric ceramic composition comprising a fired mixture of a basic component of 100 weight portions and an additional compenent in the range of 0.2 to 5 weight portions;

said basic component comprising a material represent by the following formula:

$$(1-\alpha)\{(Ba_{k-x-z}M_xL_z)O_k(Ti_{1-y}R_y)O_{2-y/2}\}+\alpha BaZrO_3$$

where, M is Mg and/or Zn, L is Ca and/or Sr, R is one or more metal elements selected from the group consisting of Sc, Y, Gd, Dy, Ho, Er, Yb, Tb, Tm and Lu; and α, k, x, z and y are numerals fulfilling the following conditions:

$0.005 \leqq \alpha \leqq 0.04$

$1.00 \leqq k \leqq 1.05$

$0 < x < 0.10$

$0 < z < 0.05$

$0.01 \leqq x+z \leqq 0.10$

$0 < y \leqq 0.04$;

said additional component comprising Li_2O, SiO_2 and MO (wherein said MO is at least one metal oxide selected from the group consisting of BaO, SrO, CaO, MgO and ZnO); and

at least one metal oxide selected from a group consisting of BaO, SrO, CaO, MgO and ZnO); and

a ratio among amounts of Li_2O, SiO_2 and MO in said additional component is within an area in a ternary system diagram of mol % having five vertexes of first to fifth vertexes, wherein:

said first vertex A represents a condition in which amounts of Li_2O is 1 mol %, SiO_2 is 80 mol % and MO is 19 mol %;

said second vertex B represents a condition in which amounts of Li_2O is 1 mol %, SiO_2 is 39 mol % and MO is 60 mol %;

said third vertex C represents a condition in which amounts of Li_2O is 30 mol %, SiO_2 is 30 mol % and MO is 40 mol %;

said fourth vertex D represents a condition in which amounts of Li_2O is 50 mol %, SiO_2 is 50 mol % and MO is 0 mol %; and

said fifth vertex E represents a condition in which amounts of Li_2O is 20 mol %, SiO_2 is 80 mol % and MO is 0 mol %.

5,184,278

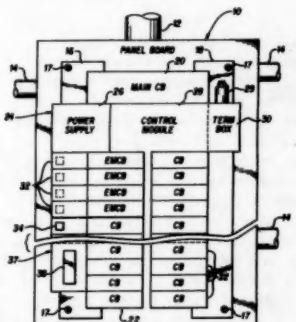
LIGHTING CONTROL AND EMERGY MANAGEMENT SYSTEM

Scott C. Jordan, Lexington; Robert L. Wolf, Winchester; Dennis W. Fleege, and Jeffrey O. Sharp, both of Lexington, all of Ky., assignors to Square D Company, Palatine, Ill.

Filed Nov. 28, 1990, Ser. No. 619,144

Int. Cl.[5] H02B *1/01*

U.S. Cl. 361—346 **3 Claims**



1. A lighting control and energy management system comprising:

an electrical panelboard having input and output power lines and a plurality of circuit breaker positions adjacent to said power lines which are arranged to receive a plurality of circuit breakers at least one of which is a remotely controllable circuit breaker;

interface module means supportable on said panelboard and including thereon power supply means for supplying power by tapping into the input power lines;

control module means, mounted to said interface module

means and being supplied with power from said power supply means for controlling the operation of said remotely controllable circuit breaker using a printed circuit board to carry control signals to the corresponding circuit breaker position; and

bus means including a plurality of connectors such that a connector is adjacent each of said plurality of circuit breaker positions, wherein the bus means couples said interface module means said remotely controllable circuit breaker occupying one of said plurality of circuit breaker positions.

5,184,279

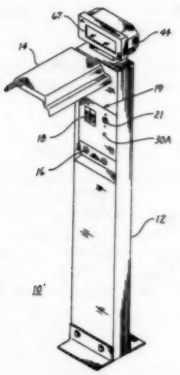
POWER PEDESTAL HAVING TELEVISION, TELEPHONE AND LUMINAIRE ADAPTER UNIT

Dale W. Horn, Mapleton, Minn., assignor to General Electric Company, New York, N.Y.

Division of Ser. No. 658,497, Feb. 21, 1991. This application Jul. 13, 1992, Ser. No. 912,394

Int. Cl.[5] H02B *1/26*

U.S. Cl. 361—356 **4 Claims**



1. An electric power pedestal comprising:

an enclosure having a base and a cover:

an electric circuit breaker within said base and accessible from a front surface thereon;

an electric power receptacle within said base and accessible from said front surface; and

said cover being hingeably attached to a top surface of said base and arranged over said electric circuit breaker and said power receptacle to prevent access to said circuit breaker and said power pedestal when said cover is against said base and to provide access to said circuit breaker and said power receptacle when said cover is rotated away from said base, said cover comprising a translucent material to provide further visual access to said circuit breaker and said power receptacle when said cover is against said base.

5,184,280

POWER RECTIFIER WITH FLEXIBLE STACKED SHEAVE BUS BAR FOR HIGH CURRENT CARRYING CONNECTIONS

Fakhry A. Fouad, Plano, Tex., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 31, 1991, Ser. No. 786,236

Int. Cl.[5] H02B *1/20*

U.S. Cl. 361—361 **10 Claims**

1. A high power bulk power processing rectifier comprising:

a plurality of components to be interconnected including, high power ferro transformers, inductors, capacitors and interconnecting current carrying busses;

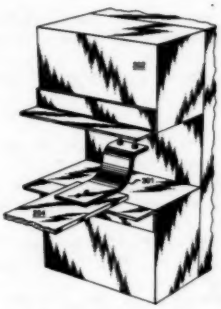
the components including conductor connection bolts to which current carrying conductors are attached to interconnect at least two components;

the at least two components having the conductor connection bolts of each component of the at least two components occurring on different planar levels from each other;

wherein the improvement comprises:

at least one flexible bus bar interconnecting the at least two components,

the flexible bus bar comprising a selected number greater



than one of thin conducting leaves stacked on top of and directly contiguous to each other providing sufficient current carrying cross section and each thin conducting leave having a first and second pair of apertures located at opposite ends of each leave, respectively, to facilitate bolt connections to the conductor connection bolts;

all of the thin conducting leaves of the flexible bus bar being bolted through the paired apertures at each end to the at least two components each having a connection location which lie in differing planes with respect to each other,

the flexible bus bar flexing and assuming a bending non planar contour when bolted to differing planes of the connection locations of the at least two components.

5,184,281

HEAT DISSIPATION APPARATUS

Victor M. Samarov, Carlisle, and Zeljko Arbanas, Lawrence, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 3, 1992, Ser. No. 845,402

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—386 **25 Claims**

1. An apparatus for dissipating heat from a system, the system having a base on which is mounted first and second heat transfer surfaces, the first heat transfer surface being separated from the second heat transfer surface by a space, said apparatus comprising:

means for dissipating heat from the first and second heat transfer surfaces, said heat dissipation means having first and second thermally conductive walls, said heat dissipation means being configured such that with said heat dissipation means mounted on the base, said first conductive wall is adjacent to the first heat transfer surface, and said second conductive wall is adjacent to the second heat transfer surface;

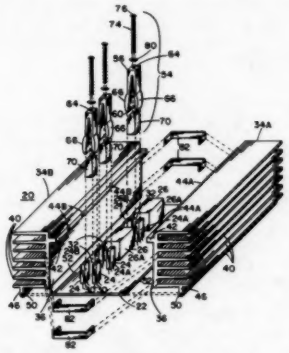
a yoke having first and second tines, said first and second tines being separated by a yoke recess;

a wedge which is adapted for insertion within said recess;

means for adjusting the position of said wedge within said recess; and

said yoke, said wedge, and said adjustment means being configured such that with said wedge inserted in said yoke

recess, and said yoke positioned within the space, said adjustment means can adjust the position of said wedge within said recess such that said first and second tines



press the first and second heat transfer surfaces into thermal communication with said first and second conductive walls, respectively.

5,184,282

IC CARD ADAPTER

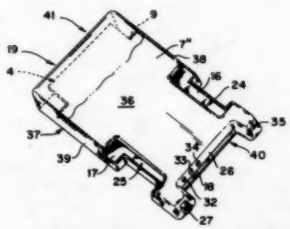
Takashi Kaneda, Chiba, Japan, and Thomas Villwock, Niedernhausen, Fed. Rep. of Germany, assignors to MIPS Co., Ltd., Tokyo, Japan and Dataline Technologies GmbH, Frankfurt-Niedernhausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 698,795, May 13, 1991, which is a continuation of Ser. No. 392,454, Aug. 11, 1989, Pat. No. 5,036,429. This application Dec. 13, 1991, Ser. No. 806,293

Claims priority, application Japan, Feb. 27, 1989, 1-20199

Int. Cl.[5] H05K *1/14*

U.S. Cl. 361—395 **30 Claims**



1. An IC card adapter connectable to an electronic device, said adapter comprising a housing having a top, a bottom and four sides, three of the sides of the housing having slots defined therein, each slot having a card receptor portion for receiving an individual IC card, at least one of the car receptor portions being in a first plane which is noncoincident and generally parallel to a second plane in which at least one other card receptor portion is located, IC cards being readily detachable from the card receptor portion.

5,184,283

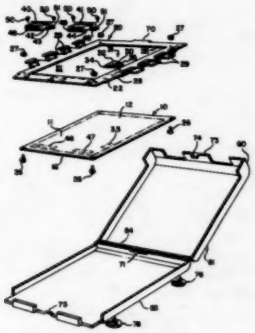
POWER DEVICE ASSEMBLY AND METHOD

Gregory R. Hamel, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1991, Ser. No. 812,412

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—395 **14 Claims**



1. A power device assembly comprising

(a) a circuit board sub-assembly comprising:

a circuit, board having an upper surface, a lower surface andd a periphery;

a heat sink frame mounted to the circuit board and defining an open area exposing at least a major portion of the upper surface of the circuit board, the heat sink frame extending outwardly beyond the periphery of the circuit board; and

at least one power device having a body and electrically conductive leads extending from the body to electrical contact with the circuit board, the body being mounted in thermally conductive contact with the heat sink frame; and

(b) a protective housing enclosing the circuit board sub-assembly, at least a portion of the heat sink frame extending outwardly from the protective housing.

5,184,284

METHOD AND APPARATUS FOR IMPLEMENTING ENGINEERING CHANGES FOR INTEGRATED CIRCUIT MODULE

Brian T. Ashelin, Kasson; Mark A. Bergquist, and Dennis E. Noltee, Sr., both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 3, 1991, Ser. No. 754,137

Int. Cl.[5] H05K *1/14*; H01L *39/06*; H01R *9/09*

U.S. Cl. 361—400 **13 Claims**

1. An apparatus for correcting or modifying the function of an integrated circuit by adding electrical circuit components to the integrated circuit, said apparatus comprising:

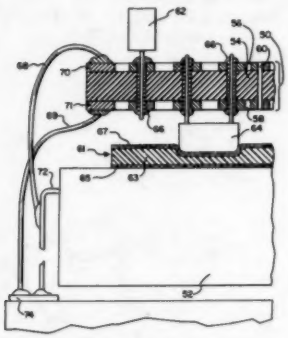
a circuit module for encapsulating the integrated circuit;

a printed-circuit board, said board having lateral boundaries less than or equal to the lateral boundaries of said module;

one or more change circuits for correcting or adding function to one or more circuits integrated into the module, each of said change circuits mounted on said board and including discrete, replaceable electrical components interconnected by printed circuits on said board;

one surface of said board being positioned adjacent to, spaced apart from and within the peripheral boundaries of

one surface of said module whereby the card does not extend beyond the boundaries of the module;



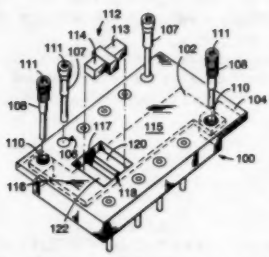
electrically conductive wires attached between the change circuits on said board and the module's integrated circuit to be corrected or modified.

5,184,285

SOCKET CONSTRUCTED WITH MOLDED-IN LEAD FRAME PROVIDING MEANS FOR INSTALLING APPITIONAL COMPONENT SUCH AS A CHIP CAPACITOR

James V. Murphy, Warwick, and Michael J. Murphy, East Greenwich, both of R.I., assignors to Advanced Interconnections Corporation, West Warwick, R.I.

Filed Nov. 17, 1987, Ser. No. 121,568
Int. Cl.[5] H05K *5/02*
U.S. Cl. 361—421 **5 Claims**



1. A socket for connection of a first electrical component to a circuit board comprising

a plurality of pins, each said pin configured for connection of the first component,

a pair of lead frame elements cut from the same lead frame, each said lead frame element having at least one hole through which a said pin extends, each of said pins that extend through a said hole being individually secured to a said lead frame element by soldering or press filting, and each said element including a connection region,

a molded plastic body formed of insulative plastic molded around said lead frame elements and surrounding said pins, said molded body having generally parallel upper and lower surfaces, and said body further having an opening extending from one of said surfaces into the interior of said body sufficiently far to expose said connection regions, and said opening having a size and depth adapted to receive a second component, and

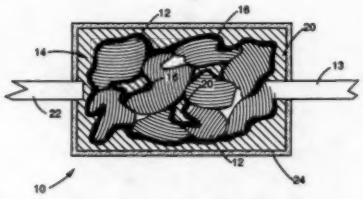
a second electrical component positioned within said opening and soldered to each of said connection regions.

5,184,286

PROCESS FOR MANUFACTURING TANTALUM CAPACITORS

Robert J. Lauf, Oak Ridge; Cressie E. Holcombe, Knoxville, and Norman L. Dykes, Oak Ridge, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Mar. 18, 1992, Ser. No. 853,474
Int. Cl.[5] H01G *9/05;* **B22F** *1/00*
U.S. Cl. 361—529 **18 Claims**



16. A tantalum capacitor comprising:

a porous tantalum compact having a plurality of pore spaces therein and all exposed tantalum surfaces having ripples therein;

an oxide layer overlaying all said ripples in said surfaces;

a conductive material infiltrating said compact into all said pore spaces and coating said oxide layer;

a pair of metallic leads operatively connected to said compact to form said capacitor; and

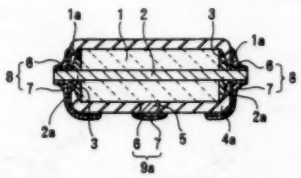
a protective coating overlaying said infiltrated compact.

5,184,287

CHIP TYPE SOLID ELECTROLYTIC CAPACITOR

Hiromichi Taniguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 9, 1992, Ser. No. 895,843
Claims priority, application Japan, Jun. 14, 1991, 3-142847
Int. Cl.[5] H01G *9/00*
U.S. Cl. 361—540 **6 Claims**



1. A chip type solid electrolytic capacitor comprising:

a capacitor element obtained by sequentially forming an oxide film, a solid electrolytic layer, and a cathode conductive layer on an anode body consisting of a valve metal in which anode leads are extracted from two opposite end faces;

an insulating sheathing resin layer coated on an entire outer surface except for both anode lead extraction end faces and a predetermined portion of one surface;

two anode terminals formed on said both anode lead extraction end faces and peripheral portions thereof; and

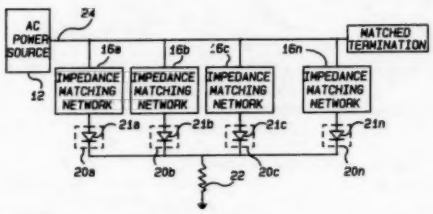
a cathode terminal formed said cathode conductive layer exposed from said insulating sheathing resin layer.

5,184,288

HIGH FREQUENCY POLY-PHASE RECTIFIER FOR CONVERTING AC POWER SIGNAL TO DC

Robert D. Washburn, Malibu; Robert S. Wedeen, Manhattan Beach; Robert F. McClanahan, Valencia; William J. Council, Newbury Park, and David M. Lusher, Gardena, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 27, 1991, Ser. No. 722,573
Int. Cl.[5] H02M *7/08*
U.S. Cl. 363—4 **12 Claims**



1. A power rectifying circuit for converting alternating current (AC) to direct current (DC), comprising:

input means for receiving an AC power signal ;

output means for supplying a load;

a network including a plurality of rectifiers coupling the input to the output, the rectifiers being arranged parallel to each other such that the AC power signal is split among the rectifiers; and

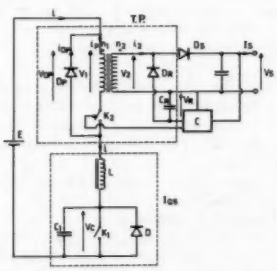
means for phase shifting the AC power signal comprising means coupled to a transmission line and displaced along its electrical length in such a manner as to provide incremental phase shifts to each rectifier, so that the AC power signal is applied to each of the rectifiers with a different phase.

5,184,289

MAGNETIC CONTROL PROCESS FOR TRANSFERING ENERGY IN A STATIC CONVERTER

André Bonnet, Quartier du Clos, 13360 Roquevaire, and Jean-Pierre Danner, Chemin des Severiers, 13600 La Ciotat, both of France

Filed Jul. 15, 1991, Ser. No. 731,826
Claims priority, application Switzerland, Jul. 13, 1990, 2343/90; Mar. 5, 1991, 664/91
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—20 **7 Claims**



1. A process using the saturation of a transformer magnetic core to control the energy transfer of a static converter having an input and an output, and including at least one transformer having a primary and a secondary winding wound on a magnetic core, said static converter acting as a current source towards said primary winding of said transformer, and comprising the steps of:

controlling the magnetization state of said transformer magnetic core through a regulation circuit,

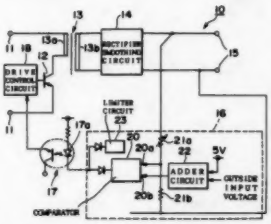
controlling the energy transfer from the input to the output of said static converter by utilizing the controlled magnetization state of said transformer magnetic core to allow energy to be transferred to said output of said static converter without damaging said static converter acting as a current source, when said transformer magnetic core has not been set to a state of saturation by said regulation circuit, and to prevent energy from being transferred to said output of said static converter when said transformer magnetic core has been set to a state of saturation by said regulation circuit.

5,184,290

SWITCHING REGULATOR

Kenichi Ozawa, and Shinichi Suekane, both of Kanagawa, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1992, Ser. No. 853,066
Claims priority, application Japan, Mar. 3, 1991, 3-29386[U]
Int. Cl.[5] H02M *3/335*
U.S. Cl. 363—21 **14 Claims**



1. A switching regulator comprising: a transformer having a primary coil and a secondary coil;

a switching transistor having a base, a collector and an emitter, said switching transistor being connected in series to said primary coil of said transformer;

wherein input voltage is applied to said primary coil of said transformer through said collector and said emitter of said switching transistor,

a pair of output terminals connected to said secondary coil of said transformer;

a comparator for comparing output voltage occurring between said output terminals with a variable reference voltage to generate an output signal; and

a control circuit for applying a drive control signal to said base of said switching transistor on the basis of said output signal from said comparator.

5,184,291

CONVERTER AND INVERTER SUPPORT MODULE

Lawrence E. Crowe, 16409 Lindenwood Rd., Lindenwood, Ill. 61049, and Mark W. Metzler, 50 Delburne Dr., Davis, Ill. 61019

Filed Jun. 13, 1991, Ser. No. 714,798
Int. Cl.[5] H02M *5/458*
U.S. Cl. 363—37 **26 Claims**

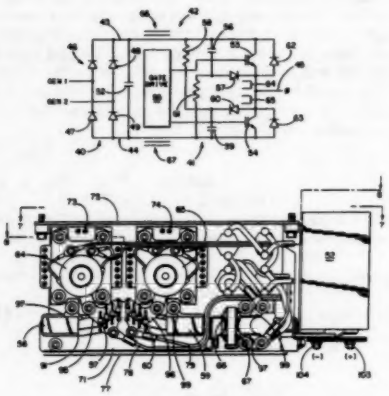
1. A module for receiving input AC and for supplying only one phase of output AC, wherein said module can be attached to and/or withdrawn form a module support as a unit, said module comprising:

heat sink means for cooling components attached in cooling relation thereto;

rectifier means for rectifying said input AC into DC, said rectifier means being attached in cooling relation to said heat sink means;

inverter switching means for inverting said DC into said one phase of said output AC, said inverter switching means

being attached, at least in part, in cooling relation to said heat sink means, said inverter switching means including an AC filter having an inductor and a capacitor attached to said heat sink means; and



connector means for interconnecting said rectifier means and said inverter switching means so that said input AC, when supplied to said module, is converted to said one phase of said output AC.

5,184,292

CLOSED-LOOP CONTROL METHOD AND APPARATUS

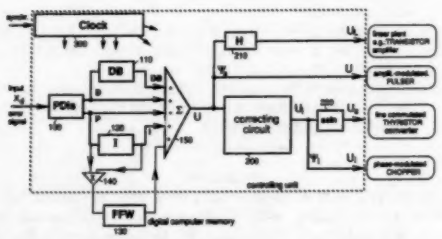
Frank Schneider, Garching, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Fed. Rep. of Germany

Filed Sep. 17, 1990, Ser. No. 583,516

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1989, 3931133

Int. Cl.[5] G05B *11/42*

U.S. Cl. 364—162 **29 Claims**



1. Controlling apparatus comprising

a) an input for receiving an error signal representing a deviation of an actual value of a variable from a desired value of said variable,

b) an output (U) for providing a manipulated signal in response to said error signal, said manipulated signal being effective in a predetermined manipulating range,

c) first controller means (**100**) having a first output (D) for providing a signal which a function of the rate of change of the error signal, and a second output (P) for providing a proportional signal which is a function of the magnitude of said error,

d) means (**150**) for combining the signals from said first and second outputs of said first controller means, and to produce said manipulated signal and to apply it to the output of said apparatus, and further characterized by

e) clock means (**300**) for producing clock signals defining subsequent time intervals,

f) limiting means (**105**) for limiting in each time interval a manipulated signal that has a portion exceeding said manipulating range to prevent exceeding said manipulating range, and

g) transfer means (**103, 104**) for combining the portion of the manipulating signal which exceeds said manipulating range with the manipulated signal of the next following time interval.

5,184,293

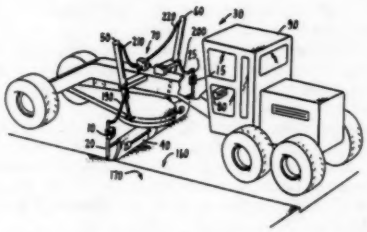
APPARATUS FOR AUTOMATIC DEPTH CONTROL FOR EARTH MOVING AND GRADING

Christopher O. Middleton, Capitola, and Colin L. Robson, San Jose, both of Calif., assignors to Spectra Physics, Freemont, Calif.

Continuation of Ser. No. 204,541, Jun. 9, 1988, Pat. No. 4,924,374. This application Mar. 23, 1990, Ser. No. 497,981

Int. Cl.[5] G06F *15/20*; G05D *1/04*

U.S. Cl. 364—167.01 **7 Claims**



1. An apparatus for generating control signals for use by a conventional control circuit in controlling the hydraulic mechanism for movement of a tool portion of a grading machine so as to maintain a selected distance between said tool portion and a reference surface comprising:

look-up table means for storing a plurality of control words at a plurality of addresses, each said control word indicating the desired amount and direction of change for the position of said tool portion including at least one control word indicating that no change is necessary;

calibration means for using acoustic energy to locate a reference surface at a chosen distance from a predetermined portion of said grading machine and to establish the chosen distance as a reference distance and mapping said reference distance to a pointer address for an address in said look-up table where said at least one control word indicating no change in tool position is necessary is stored; and

second means for detecting a distance proportional to an actual distance between said reference surface and said tool portion and for mapping said detected distance to a pointer address to access a control word in said look-up table indicating a correction factor and direction of change which will move said tool portion to said selected distance from said reference surface;

a selected type of hydraulic control means from a class of similar type hydraulic control means all of which include hydraulic pressure control valves to control hydraulic pressure applied to rams in said hydraulic mechanism, said selected hydraulic control means being coupled to said second means and to said hydraulic mechanism for receiving said control signals and for manipulating said hydraulic control valves in an appropriate manner to cause said tool position to be varied in accordance with the commands encoded in said control word; and

means in said second means for determining which type of

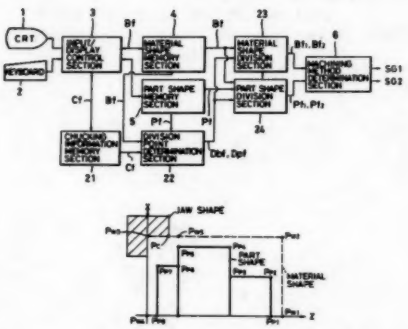
said hydraulic control means has been selected for coupling to said second means by reading signals sent to said second means from said selected hydraulic control means and for causing electrically compatible control signals to be generated and sent to said selected hydraulic control means to implement the commands for tool portion positioning encoded in said access control word.

5,184,294

APPARATUS FOR GENERATING NUMERICAL CONTROL INFORMATION FOR MACHINING PARTS

Yasushi Fukaya, Oguchi, Japan, assignor to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Apr. 26, 1990, Ser. No. 514,837
Claims priority, application Japan, Apr. 28, 1989, 1-111600
Int. Cl.[5] G06F *15/46*; G05B *19/92*
U.S. Cl. 364—191 **2 Claims**



1. An apparatus for generating numerical control information for machining a part member, comprising:

a division point determination means for determining a division point between first and second steps based on a material shape, a part shape and a jaw shape supplied;

a part shape division means for generating a first step part shape and a second step part shape based on the division point, the material shape and the part shape; and

a material shape division means for generating a first step material shape and a second step material shape based on the division point, the material shape and the first step part shape;

wherein numerical control information for the first step is formed from the first step material shape and the first step part shape, while numerical control information for the second step is formed from the second step material shape and the second step part shape;

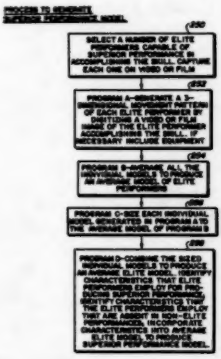
and wherein said division point determination means finds a first group of corner points which do not interfere with a jaw shape from a group of corner points on the part shape, and finds a second group of corner points having maximum coordinate values in a diametral direction of the part shape from among the first group of corner points, and finds a corner point having a minimum coordinate value in a longitudinal direction of the part shape from among the second group of corner points, the corner point thereby being used as the division point for outside diameter machining.

5,184,295

SYSTEM AND METHOD FOR TEACHING PHYSICAL SKILLS

Ralph V. Mann, 1515 SE. 27 Terrace, Ocala, Fla. 32671

Division of Ser. No. 867,047, May 30, 1986, Pat. No. 4,891,748.
This application Oct. 16, 1989, Ser. No. 422,015
The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.
Int. Cl.[5] G06F *15/44*
U.S. Cl. 364—410 **34 Claims**


PROCESS TO GENERATE SUPERIOR PERFORMANCE MODEL
(250)
SELECT A NUMBER OF ELITE PERFORMERS CAPABLE OF SUPERIOR PERFORMANCE IN ACCOMPLISHING THE SKILL. CAPTURE EACH ONE ON VIDEO OR FILM
(252)
PROGRAM A-GENERATE A 3-DIMENSIONAL MOVEMENT PATTERN OF EACH ELITE PERFORMER BY DIGITIZING A VIDEO OR FILM IMAGE OF THE ELITE PERFORMER ACCOMPLISHING THE SKILL. IF NECESSARY INCLUDE EQUIPMENT
(254)
PROGRAM B-AVERAGE ALL THE INDIVIDUAL MODELS TO PRODUCE AN AVERAGE MODEL OF ELITE PERFORMERS
(256)
PROGRAM C-SIZE EACH INDIVIDUAL MODEL GENERATED IN PROGRAM A TO THE AVERAGE MODEL OF PROGRAM B
(258)
PROGRAM D-COMBINE THE SIZED INDIVIDUAL MODELS TO PRODUCE AN AVERAGE ELITE MODEL. IDENTIFY CHARACTERISTICS THAT ELITE PERFORMERS EMPLOY FOR ENDURING SUPERIOR PERFORMANCE. MODIFY CHARACTERISTICS THAT THE ELITE PERFORMERS EMPLOY THEY ARE ABSENT IN NON-ELITE PERFORMANCES. INCORPORATE CHARACTERISTICS INTO AVERAGE ELITE MODEL TO PRODUCE SUPERIOR PERFORMANCE MODEL

34. A system for generating a model of superior performance for teaching a student a physical skill, in which a number of elite performers who superiorly perform the physical skill are identified, the system comprising:

(a) means for generating a plurality of video frames of a three-dimensional movement pattern for each elite performer performing the physical skill;

(b) means for standardizing the frames of the video movement patterns such that a frame for each elite performer corresponds to an equivalent movement pattern for the other elite performers;

(c) means for averaging the equivalent frames of movement patterns for all of the elite performers for producing an average model representative of an average movement pattern;

(d) means for sizing each of the three-dimensional movement patterns to the average model, and for combining the movement patterns of all of the elite performers; and

(e) means for averaging all of the movement patterns of the sizing means for producing a model incorporating the patterns of all of the elite performers.

5,184,296

ELECTRONIC TRANSLATOR WITH MULTIPLE SPEED SEARCHING FUNCTION

Shinichi Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 713,606, Jun. 11, 1991, abandoned, which is a continuation of Ser. No. 424,870, Oct. 20, 1989, abandoned. This application Dec. 4, 1991, Ser. No. 801,587
Claims priority, application Japan, Oct. 28, 1988, 63-270900
Int. Cl.[5] G06F *15/38*
U.S. Cl. 364—419 **7 Claims**

1. An electronic apparatus comprising:

input means for inputting words;

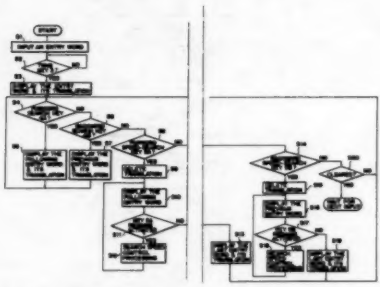
memory means for storing data representing a plurality of words consecutively in said memory means and corresponding to the inputted words and for storing data representing a plurality of corresponding words corresponding to said data representing said plurality of words;

display means for displaying a word inputted by said input means and a corresponding word, from said memory

means, represented by data corresponding to data representing a word stored in said memory means corresponding to said inputted word;

instruction means for generating a first or second instruction instructing the reading of data representing a consecutive word consecutively stored in said memory means relative to said word displayed on said display means, and instructing the display of said consecutive word on said display means in place of the previously displayed word;

first control means for controlling said display means to display the consecutive word read from said memory means while the first instruction is being generated by said instruction means; and



second control means for controlling said display means to display the consecutive word read from said memory means while the second instruction is being generated by said instruction means, and for, while the second instruction by said instruction means is not being generated, searching said memory means for data representing a corresponding word corresponding to the consecutive word then displayed on said display means, and controlling said display means to display the searched corresponding word;

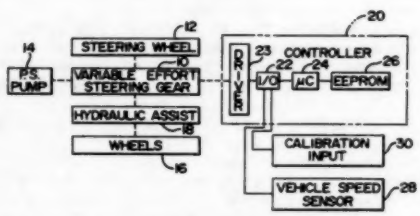
wherein said data representing a word stored in said memory means represents a word in a first language, and said data representing a corresponding word represents a word in a second language or a definition of the word in the first language.

5,184,297

METHOD OF CALIBRATING POWER STEERING FOR UNIFORM VEHICLE-TO-VEHICLE STEERING EFFORT

David W. Graber, Millington; Dennis C. Eckhardt, Saginaw; Andrzej M. Pawlak, Troy, and Bryan L. Faist, Frankenmuth, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 24, 1990, Ser. No. 602,568
Int. Cl.[5] B62D *5/00*
U.S. Cl. 364—424.05 **3 Claims**



1. In a vehicle power steering system including a steering gear which develops steering assist force in response to an input force, and an electrically controllable variable steering effort mechanism for varying the developed steering assist force, a method of calibrating said system to a standard value of steering assist force comprising the steps of:

measuring a steering assist force developed in response to an applied input force;

determining a variance of the measured assist force from a standard value;

calculating a correction value corresponding to said variance;

storing the correction value; and

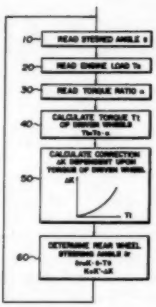
controlling the variable steering effort mechanism in accordance with the correction value to at least partially compensate for said variance.

5,184,298

REAR WHEEL STEERING SYSTEM FOR VEHICLE

Takashi Imaseki; Minoru Tamura; Toru Iwata, and Yuichi Fukuyama, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Aug. 30, 1990, Ser. No. 575,012
Claims priority, application Japan, Sep. 1, 1989, 1-227074
Int. Cl.[5] B62D *6/00*
U.S. Cl. 364—424.05 **15 Claims**



1. A rear wheel steering system for a vehicle having front and rear steered wheels and an engine driving a wheel set comprising:

first means for determining the amount of torque transmitted from the vehicle engine to the driven wheel set and providing a signal indicative thereof;

second means for determining front wheel steering angle to provide a signal indicative thereof;

third means responsive to the signal from said second means for calculating rear wheel steering angle based on the steered angle of the front wheel;

fourth means responsive to the signal from said first means for determining a correction for the rear wheel steering angle calculated by said third means, the correction having an amplitude of a preselected relation to the magnitude of the amount of torque transmitted from the engine to the driven wheel set to provide a rear wheel target steering angle, the fourth means deriving a signal indicative of the rear wheel target steering angle; and

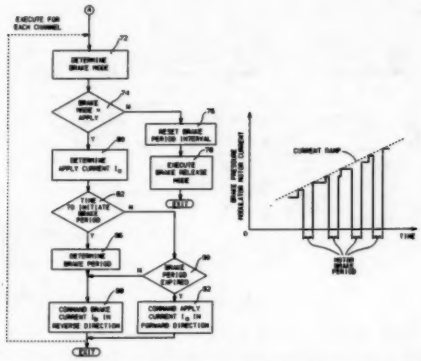
fifth means responsive to the amplitude of the signal derived by said fourth means for steering the rear wheel set in accordance with the rear wheel steering angle calculated by said third means and as modified by said correction.

5,184,299

ANTILOCK BRAKE SYSTEM MOTOR SPEED CONTROL

Martin A. Hogan, Northville; Kevin G. Leppek, Troy, both of Mich., and Peter J. Spadafora, Howald, Luxembourg, assignors to General Motors Corporation, Detroit, Mich. and Deleco Electronics Corporation, Kokomo, Ind.

Filed May 31, 1990, Ser. No. 531,397
Int. Cl.[5] B60T *8/64*
U.S. Cl. 364—426.02 **8 Claims**



1. A method of controlling the wheel brake pressure applied to the brake of a vehicle wheel traveling over a road surface in a vehicle braking system having a pressure modulator including a motor for generating a motor torque in response to motor current to control the applied wheel brake pressure, the method comprising the steps of:

sensing an incipient wheel lockup condition;

controlling the motor current to release wheel brake pressure when an incipient wheel lockup condition is sensed to allow wheel recovery from the incipient wheel lockup condition;

ramping the motor current following wheel recovery to increase the applied wheel brake pressure until an incipient wheel lockup is again sensed; and

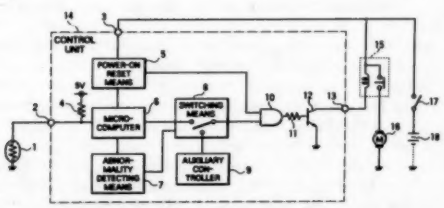
recurrently braking the motor while the motor current is ramped, the braking providing control of motor speed.

5,184,300

CONTROL APPARATUS FOR A VEHICLE FOR CONTROLLING A DEVICE MOUNTED THEREON

Toshiro Hara; Yoshimasa Sato, and Noboru Yagi, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1991, Ser. No. 654,984
Claims priority, application Japan, Mar. 12, 1990, 2-61574
Int. Cl.[5] G05B *15/00*
U.S. Cl. 364—431.1 **6 Claims**



1. A control apparatus for a vehicle for controlling a device (16) mounted thereon, the apparatus comprising:

a) a main controller (6) for controlling the device in an on-off manner;

b) reset means (5) for initially resetting the main controller for a predetermined time period after a key switch (17) of the vehicle is turned on, said resetting causing the main controller to appear to be functioning abnormally during the predetermined time period;

c) an auxiliary controller (9) for controlling the device in a continuously on manner in place of the main controller when the main controller is abnormal;

d) switching means (8) for performing switching between a first position in which the device is controlled by the main controller and a second position in which the device is controlled by the auxiliary controller;

e) means (7) for detecting an abnormality of the main controller and switching over the switching means into the second position when an abnormality of the main controller is detected; and

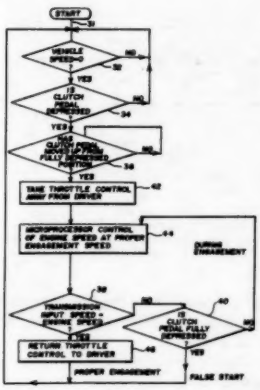
f) disabling means (10) for disabling the output of the auxiliary controller during the predetermined time period when the main controller is being reset by the reset means and appears to be functioning abnormally, to thereby prevent the device from being controlled in a continuously on manner during said predetermined time period.

5,184,301

AUTOMOTIVE VEHICLE MICROPROCESSOR CONTROL HAVING CLUTCH PRIORITY ENGINE SPEED CONTROL

Mark W. Stasell, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Nov. 27, 1990, Ser. No. 618,755
Int. Cl.[5] B60K *41/02*
U.S. Cl. 364—431.07 **2 Claims**


START
VEHICLE SPEED=0
IS CLUTCH PEDAL DEPRESSED
TAKE THROTTLE CONTROL AWAY FROM DRIVER
MICROPROCESSOR CONTROL OF ENGINE SPEED AT PROPER ENGAGEMENT SPEED
DURING ENGAGEMENT
TRANSMISSION INPUT SPEED = ENGINE SPEED
IS CLUTCH PEDAL FULLY DEPRESSED
RETURN THROTTLE CONTROL TO DRIVER
PROPER ENGAGEMENT
FALSE START

1. In an automotive vehicle having a powertrain which comprises an internal combustion engine, a clutch, a manual transmission, and road-engaging wheels, said engine comprising a throttle and an output shaft, said clutch serving to couple said engine output shaft with said transmission input shaft, said powertrain comprising means coupling said transmission output shaft with at least some of said wheels, said vehicle comprising controls that are selectively operable by a driver of the vehicle comprising a clutch control comprising a clutch pedal disposed for operation by the driver for selectively engaging and disengaging the clutch and a throttle control comprising an accelerator pedal disposed for operation by the driver for selectively setting the throttle, said vehicle further comprising a microprocessor that is operatively coupled with said powertrain such that said microprocessor can act on information comprising throttle setting, vehicle road speed, engine output

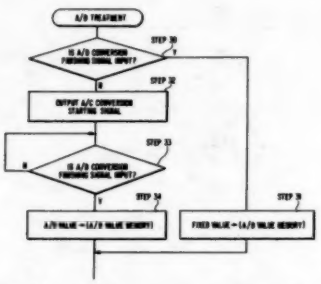
shaft speed, and transmission input shaft speed, and can distinguish between clutch engagement and disengagement, the improvement which comprises means, effective upon an attempt to launch the vehicle from standstill by the driver's operating the clutch control via said clutch pedal to cause the clutch to operate from disengagement toward engagement and also operating the throttle control via said accelerator pedal, to cause the throttle to occupy a setting that causes the engine output shaft to rotate at a certain speed programmed into the microprocessor and desired for minimizing powertrain wear and tear in consequence of clutch engagement at vehicle launch, to maintain said certain speed for said engine output shaft irrespective of how said throttle control is operated by the driver via said accelerator pedal until said transmission input shaft has been accelerated to a predetermined speed programmed into the microprocessor and indicating a proper launch, and to return the control of said throttle setting to the driver upon an occurrence of said proper launch.

5,184,302

ENGINE CONTROL APPARATUS INCLUDING A/D CONVERTER FAILURE DETECTION ELEMENT AND METHOD THEREFOR

Yasuhiko Ishida, and Katsuhiko Kondo, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Jan. 30, 1991, Ser. No. 647,967
Claims priority, application Japan, Feb. 8, 1990, 2-30250
Int. Cl.[5] G05B *23/02;* **H03M** *1/10*
U.S. Cl. 364—431.11 **4 Claims**



1. A method for operating a control apparatus for an engine having a plurality of controlled sections, said method comprising the steps of:

detecting at least one analog signal representative of operational condition of said engine;

converting said analog signal into a digital output;

detecting whether an abnormality occurs in said converting step;

when said abnormality does not occur, calculating a control quantity for said engine based on said digital output;

when said abnormality does occur, calculating said control quantity for said engine based on a previously determined fixed value in place of said digital output; and

actuating at least one of said controlled sections of said engine in accordance with said control quantity;

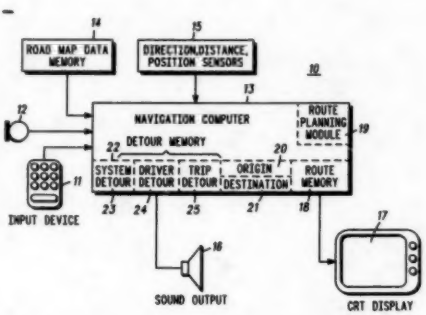
wherein said detecting step further comprises the step of examining, at the beginning of each operation, whether an A/D conversion finishing signal is present so as to permit, when said finishing signal is present, a determination of occurrence of said abnormality during said converting step.

5,184,303

VEHICLE ROUTE PLANNING SYSTEM

Laura J. Link, Hanover Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 28, 1991, Ser. No. 662,674
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—449 **28 Claims**



21. A vehicle route planning system comprising:

map memory means for storing fixed road path data corresponding to fixed roadways available for vehicle travel;

detour means for having a system user designate, via stored detour data, which of said road path data should be excluded in calculating a desired route between vehicle start and destination locations;

route planning means coupled to said map memory means and detour means for utilizing said fixed road path data, exclusive of the road path data corresponding to said detour data, to calculate route data defining a desired route, via said fixed roadways, for vehicle travel between said vehicle start and destination locations, and

means for providing route information to said system user based on said calculated route data,

wherein the improvement comprises said detour means comprising driver detour means for having a user designate at least some of said detour data as driver detour data associated with an ID code identifying a vehicle driver and wherein said route planning means excludes road path data corresponding to said driver detour data for all desired routes to be calculated between any start and designation locations for a vehicle driver identified to said system as having an ID code corresponding to the ID code associated with said driver detour data.

26. A vehicle route planning system comprising:

map memory means for storing fixed road path data corresponding to fixed roadways available for vehicle travel;

route planning means coupled to said map memory means for utilizing said fixed road path data to calculate route data defining a desired route, via said fixed roadways, for vehicle travel between vehicle start and destination locations, and

means for providing route information to a system user based on said calculated route data,

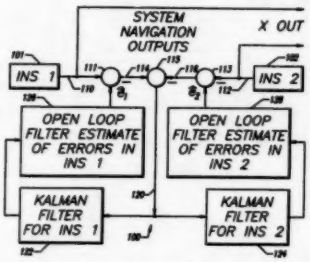
wherein the improvement comprises driver memory means for having a user designate and store some data as driver route calculation data associated with an ID code identifying a vehicle driver and wherein said route planning means recalls and utilizes said stored driver route calculation data for calculating routes for a vehicle driver identified to said system as having an ID code corresponding to the ID code associated with said driver route calculation data.

5,184,304

FAULT-TOLERANT INERTIAL NAVIGATION SYSTEM

James R. Huddle, Chatsworth, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 26, 1991, Ser. No. 692,348
Int. Cl.[5] G06F 15/50
U.S. Cl. 364—453 8 Claims


SYSTEM NAVIGATION OUTPUTS
X OUT
INS 1
INS 2
OPEN LOOP FILTER ESTIMATE OF ERRORS IN INS 1
OPEN LOOP FILTER ESTIMATE OF ERRORS IN INS 2
KALMAN FILTER FOR INS 1
KALMAN FILTER FOR INS 2

1. A fault-tolerant inertial navigation system, comprising:

only two independent inertial navigation units, each of said inertial navigation units performing navigational functions, and each of said inertial navigation units comprising a plurality of single degree of freedom navigational instruments, none of which produce redundant measurements, including at least three linear force sensors and three angular change sensors, any two of said linear sensors and any two of said angular change sensors of either unit aligned other than co-linear; and, all three of said linear sensors, and all three of said angular change sensors positioned in different planes;

each of said inertial navigation units producing a set of independently derived navigational solutions at each of their respective outputs, said independently derived navigational solutions providing estimates of error parameters indicative of the performance of each sensor in each of said navigation units;

means for comparing said independent navigational solutions of each of said navigation units and detecting any significantly degraded performance of either of said navigation units, by contrasting said estimates of error parameters of each instrument in one navigation unit with the estimates of error parameters in the other navigation unit:

whereby, one of said navigation units indicating such degraded performance, is isolated and identified as to being faulty.

5,184,305

METHOD AND APPARATUS FOR OPERATING AN AUTOMATIC TEXTILE MACHINE

Reinhard Gronenberg, Mönchengladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst AG & Co., Mönchengladbach, Fed. Rep. of Germany

Filed Dec. 3, 1990, Ser. No. 621,627
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1989, 3939789
Int. Cl.[5] G06F 15/46; D01H 13/14; B65H 67/06
U.S. Cl. 364—470 22 Claims

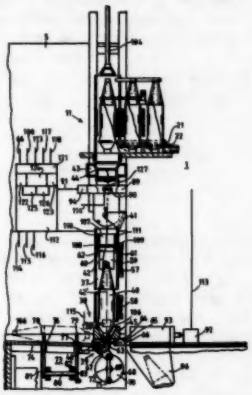
1. Method for operating a textile machine that operates automatically according to an operating program, which comprises:

subdividing a course of operation into individual operating steps;

monitoring at least one of the operating steps with at least one sensor for detecting at least one of presence of an article, absence of an article, movement past the sensor of an article connected to the textile machine, success of an operation and failure of an operation; and

tripping an automatic intervention into the course of operation as a function of the outcome of the monitoring step;

automatically monitoring a functional capability of the sensor; and



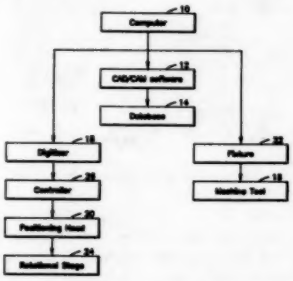
automatically switching over from the operating program to a prepared substitute program no longer requiring the sensor for continued operation of the textile machine after failure of the sensor.

5,184,306

AUTOMATED HIGH-PRECISION FABRICATION OF OBJECTS OF COMPLEX AND UNIQUE GEOMETRY

Arthur G. Erdman, New Brighton; Elizabeth D. Rekow, Fridley; Donald R. Riley, Edina; Barney Klamecki, Minneapolis; Yang Zhu, St. Paul, all of Minn., and Jeong-Ho Ahn, Seoul, Rep. of Korea, assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 365,140, Jun. 9, 1989, Pat. No. 5,128,870. This application Dec. 20, 1991, Ser. No. 812,588
Int. Cl.[5] G06F 15/46, 15/60
U.S. Cl. 364—474.05 52 Claims



1. A method of machining a reproduction of a 3-dimensional object such that the reproduction substantially duplicates all surfaces of said object, comprising:

(a) retrieving at least one generic form of said object from a computer, said generic form comprised of at least one set of coordinates residing on a plurality of scan lines;

(b) using a computer, automatically identifying feature coordinates in said set of coordinates to emphasize features on said generic form;

(c) generating a plurality of parametric curves extending through said feature coordinates;

(d) generating a parting line through said scan lines to divide said generic form into a plurality of regions to avoid undercuts and associated interferences during machining;

(e) generating a plurality of contour lines between coordinates on adjacent said scan lines, said coordinates including said feature coordinates;

(f) fixturing a material to be shaped into the reproduction of said object such that said material may be machined; and

(g) transmitting a plurality of tool paths computed from said contour lines from the computer to a machine tool such that said machine tool is directed to machine the reproduction of said object.

5,184,307

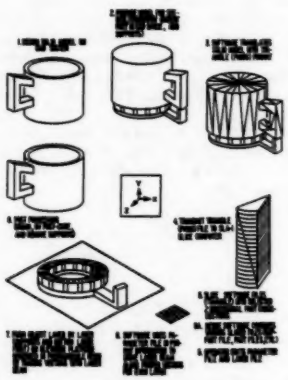
METHOD AND APPARATUS FOR PRODUCTION OF HIGH RESOLUTION THREE-DIMENSIONAL OBJECTS BY STEREOLITHOGRAPHY

Charles W. Hull, Santa Clarita; Stuart T. Spence, So. Pasadena; David J. Albert, Aptos; Dennis R. Smalley, Baldwin Park; Richard A. Harlow, Marina Del Rey; Phil Stinebaugh, Sunnyvale; Harry L. Tarnoff, Van Nuys; Hop D. Nguyen, Little Rock; Charles W. Lewis, Van Nuys; Tom J. Vorgitch, Simi Valley, and David Z. Remba, Studio City, all of Calif., assignors to 3D Systems, Inc., Valencia, Calif.

Continuation-in-part of Ser. No. 269,801, Nov. 8, 1988, which is a continuation-in-part of Ser. No. 182,830, Apr. 18, 1988, Pat. No. 5,059,359. This application Mar. 31, 1989, Ser. No. 331,644

Int. Cl.[5] G06F *15/46;* **B29C** *35/08, 67/00*

U.S. Cl. 364—474.24 **81 Claims**



1. A system for producing a three-dimensional object comprising:

means for deriving data descriptive of cross-sections of the object from data descriptive of the object, including at least some skin data descriptive of at least part of at least one cross-section;

a container containing at least in part material capable of selective physical transformation upon exposure to the synergistic stimulation;

means for successively providing layers of said material;

means for selectively exposing said layers of said material to said synergistic stimulation in accordance with said data descriptive of said cross-sections of said object to form successive object cross-sections; and

control means for obtaining said cross-sectional descriptive data from said deriving means, and utilizing said data to control said means for successively providing said layers, and said means for selectively exposing said layers, to produce said three-dimensional object comprising said successively formed cross-sections.

5,184,308

FAULT SIMULATION METHOD

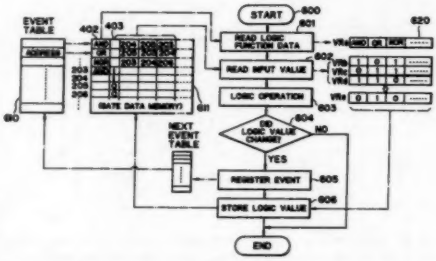
Masahiko Nagai, Kanagawa; Hiroo Watai, Hadano; Takaharu Nagumo, Kokubunji, and Kaoru Moriwaki, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1990, Ser. No. 591,148

Claims priority, application Japan, Oct. 2, 1989, 1-257236

Int. Cl.[5] G06F *15/60*

U.S. Cl. 364—489 **8 Claims**



1. A fault simulation method for detecting a fault in a logic circuit comprising one or more logic gates having pins for data input and data output and functioning as an object of fault simulation, on the basis of logic simulation to be implemented by injecting a fault logic value into a position of fault assumption in the logic circuit, comprising the steps of:

performing logical modification of the logic circuit into a logic circuit configuration including logic gates of a predetermined basic gate form;

forming pin management data for the logic gates of the logic circuit after the logical modification which indicates correspondence of pins of the modified logic circuit to the position of fault assumption of each of the pins prior to the logical modification;

injecting the fault logic value into the position of fault assumption of pins of the gate of the logic circuit subsequent to the logic modification in a position corresponding to each of the pins prior to the logic modification based on the pin management data; and

executing fault simulation using the logic circuit into which the fault logic value is injected.

5,184,309

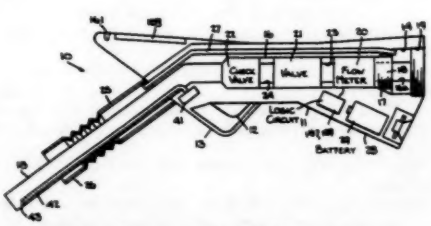
FLUID DISPENSING NOZZLE INCLUDING IN LINE FLOW METER AND DATA PROCESSING UNIT

W. Dwain Simpson, Wilton, and James H. Pyle, Weston, both of Conn., assignors to Saber Equipment Corp., Stratford, Conn.

Filed Mar. 20, 1990, Ser. No. 496,219

Int. Cl.[5] B67D *5/22*

U.S. Cl. 364—510 **12 Claims**



1. A nozzle to dispense a fluid, which comprises:

a handle element;

a modular housing within said handle element, said modular housing being slidably removable from said handle element, said modular housing including:

a fluid flow passage extending therethrough, and

a controllable flow control valve arranged in said fluid flow passage for control of fluid therethrough;

a flow meter arranged to measure a flow of fluid through said fluid flow passage;

an electronic data processing unit mounted in said handle element;

said electronic data processing unit including a data input port coupled to said flow meter for input of data indicative of fluid flow through said nozzle, wherein when said modular housing is slidably removed from said handle element, each of said flow control valve, said fluid flow meter, and said fluid flow passage remain with said modular housing and said electronic data processing unit remains with said handle element.

5,184,310

SIGNAL GENERATION CIRCUIT

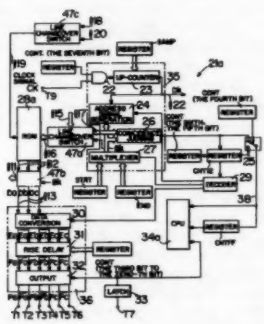
Norio Takenouchi, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1990, Ser. No. 501,857

Claims priority, application Japan, Mar. 31, 1989, 1-82411; Mar. 1, 1990, 2-51363

Int. Cl.[5] G06F *15/20*

U.S. Cl. 364—550 **10 Claims**



10. A signal generation circuit comprising:

random access memory for storing a rotational speed of a motor set by an external controller;

read only memory for storing an operational program and waveform data;

central processing means for addressing the operational program stored in said read only memory;

waveform generating means for addressing and processing waveform data in accordance with the operational program to generate a compressor control signal used to control a motor such that its rotational speed matches the rotational speed stored in said random access memory; and

line changeover means for operatively connecting said random access memory and said read only memory to said central processing means when the operational program is to read from said read only memory and for operatively connecting said random access memory and said read only memory to said waveform generating means when waveform data is to be read from said read only memory.

5,184,311

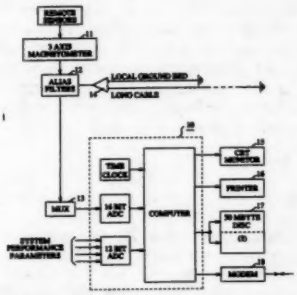
METHOD OF OPERATING AN INSTALLATION THAT COMPRISES ONE OR MORE LONG ELECTRICAL CONDUCTORS

Joseph S. Kraus, Stirling; Louis J. Lanzerotti, Morristown, and Lester V. Medford, Murray Hill, all of N.J., assignors to AT& Bell Laboratories, Murray Hill, N.J.

Filed Jun. 19, 1990, Ser. No. 540,434

Int. Cl.[5] G01V *3/08*

U.S. Cl. 364—554.01 **9 Claims**



1. Method of operating an installation, the installation comprising one or more long electrical conductors extending over a geographic region; and means, connected to the conductor or conductors, for causing the flow of electric current in said one or more of the conductors; said method comprising:

a) obtaining data comprising substantially real-time data representative of the time derivative of Earth's magnetic field at or near Earth's surface at a multiplicity of locations including one or more locations within the geographic region, said derivative to be designated dB/dt;

b) comparing all or part of said data, or of quantities derived from said data, to pre-determined critical values; and

c) if indicated by the result of the comparison of b), changing the operating conditions of the installation such that the installation is less vulnerable to the effects of geomagnetically induced currents.

5,184,312

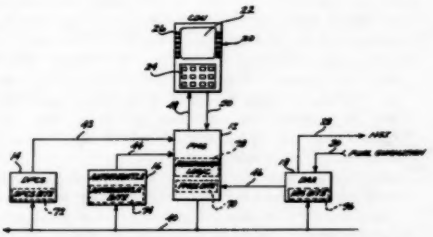
DISTRIBUTED BUILT-IN TEST EQUIPMENT SYSTEM FOR DIGITAL AVIONICS

Gordon F. Ellis, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 793,586, Oct. 13, 1985, abandoned. This application Apr. 26, 1991, Ser. No. 692,781

Int. Cl.[5] G06F *11/00*

U.S. Cl. 364—551.01 **15 Claims**



1. A digital avionics system designed for installation in an aircraft as an integral part thereof, the system comprising:

a plurality of line replaceable units (LRUs), each designed to transmit an output signal containing information from which faulty operation of said each LRU may be detected;

a distributed computer system, designed for installation in an aircraft as an integral part thereof, coupled to said plurality of LRUs, for receiving said output signals provided by said plurality of LRUs, said computer system comprising a built-in test equipment (BITE) program (a) for performing diagnostic operations using said information in said output signals so as to isolate faulty ones of said plurality of LRUs and (b) for performing test operations after faulty LRUs have been replaced to verify replacement LRUs function properly, said BITE program comprising an interactive, natural language interface for facilitating operation of said BITE program by a user thereof; and

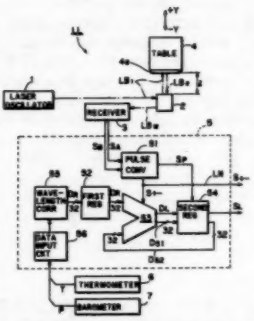
control/display means, designed for installation in the cockpit of the aircraft, coupled to said distributed computer system, for permitting a user of the avionics system to communicate therewith, and for permitting a maintenance technician to operate said BITE program using said interactive, natural language interface.

5,184,313

CONVERSION DEVICE FOR LASER INTERFEROMETIC MEASURING APPARATUS

Akira Kuwabara, and Yasufumi Koyama, both of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed May 31, 1990, Ser. No. 531,040
Claims priority, application Japan, May 31, 1989, 1-140100
Int. Cl.[5] G01B *11/14*
U.S. Cl. 364—561 **9 Claims**



1. Distance measuring apparatus including a laser interferometic measuring device and a conversion device;

said laser interferometic measuring device generating out of phase first and second pulses each time a distance being measured changes by a reference distance λ/N, where λ is a wavelength of a laser beam employed in said laser interferometic measuring device and N is a positive integer;

said conversion device receiving said pulses and generating an output signal representing the distance measured by said apparatus, said conversion device comprising:

(a) first register means for holding a conversion coefficient representing said reference distance in the form of digital data having M-digits, where M is a positive integer and a unit distance in said measuring system of units corresponds to a unit number in an (M+1)-th digit from a least significant digit in said digital data;

(b) means for converting said first and second pulses into a timing pulse which is generated every time said distance being measured is changed by said reference distance;

(c) an arithmetic calculator means for receiving a predetermined initial value and for adding said conversion coefficient to said initial value every time said timing pulse is generated, said arithmetic calculator means being operable to generate a carry signal every time a result of calculation exceeds a full range of M-digits; and

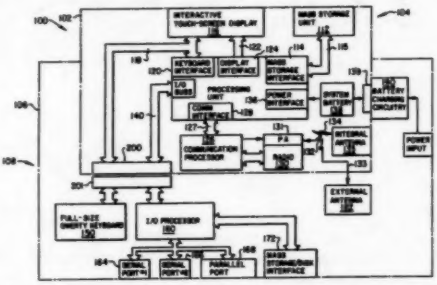
(d) means for generating said distance signal every time said carry signal is generated.

5,184,314

MOBILE DATA PROCESSING AND COMMUNCATIONS SYSTEM WITH REMOVABLE PORTABLE COMPUTER

Edward J. Kelly, 3317 Skyview, Lynchburg, Va. 24501, and Joseph P. Howard, 25 Cedar Dr., Lebanon, Oreg. 97355

Filed Jul. 31, 1991, Ser. No. 738,559
Int. Cl.[5] G06F *1/00*
U.S. Cl. 364—709.01 **10 Claims**



1. A mobile data processing and communications system comprising:

a hand-held portable computer having a touch-screen interactive display, a microprocessor and a communications processor, the portable computer having a first mode of operation wherein data is entered through, and displayed on the touch-screen interactive display, said portable computer further including a means coupled to the communications processor for transmitting data by RF transmission to a central computer;

a keyboard converter having a full size Qwerty keyboard, an input/output processor, a means for transmitting data by RF transmission and a cradle for receiving the hand-held portable computer; and

means for interfacing the hand-held portable computer with the keyboard converter when the keyboard converter cradle receives the portable computer, the portable computer having a second mode of operation wherein data may be input to the portable computer through the Qwerty keyboard and displayed on the touch-screen interactive display of the portable computer, said means for interfacing including means to enable transmission of data to the central computer from the means for transmitting of the keyboard converter when the keyboard converter cradle receives the portable computer.

5,184,315

COMPREHENSIVE COMPUTER DATA AND CONTROL ENTRIES FROM VERY FEW KEYS OPERABLE IN A FAST TOUCH TYPING MODE

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 678,543, Apr. 16, 1991, abandoned, which is a continuation of Ser. No. 597,034, Sep. 20, 1990, Pat. No. 5,062,070, which is a continuation of Ser. No. 395,216, Aug. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 729,559, May 2, 1985, abandoned, and a continuation-in-part of Ser. No. 787,633, Oct. 15, 1985. This application May 5, 1992, Ser. No. 879,128
Int. Cl.[5] G06F *3/023*
U.S. Cl. 364—709.16 **2 Claims**

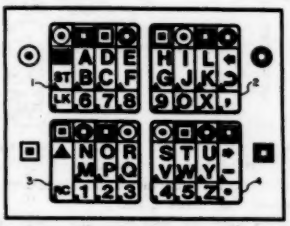
1. A four key alphanumeric keyboard entry system providing for forty eight entries, comprising in combination:

four keys;

a graphic key chart on each key showing symbolically twelve entry command choices available for each key including for the set of four keys entry choices for twenty six alphabetic characters and ten decimal digits, said entry command choices being arranged in a pattern of three rows and four columns, and three further sets of indicia markers on each key with sets respectively identifying the four columns and two of the three rows of keys, the four column markers respectively identifying each of the four keys;

a computer for executing the entry command choices;

keyboard entry means for providing entry command signals responsive to the entry choices shown on the four keys for a two-stroke-per-entry mode accommodating the forty eight command entry choices, including the indicia markers, said two strokes being identified by a first stroke entry choice of a key upon which the desired symbol is found



and the second stroke entry being identified by a column marker for the column in which the desired symbol is located;

mode selection means for establishing three modes for respectively processing entries identified on the three respective rows of entry choices, a first default mode for providing entry signals from the row not marked by the indicia markers and two further modes respectively for providing entry signals from the two rows identified by indicia markers when selected by a preceding entry choice of the indicia marker for designing the respective row, thereby implementing a four-stroke-per-entry selection mode for command entries in the two rows with indicia markers; and

keyboard assignment means for assigning to the row not marked by indicia markers for direct two-stroke-per-entry selection mode, those entry choices and symbols more frequently encountered in operation.

5,184,316

SYSTEM FOR VERY EFFICIENTLY CODING BY PERFORMING INTERBLOCK AND INTRABLOCK NORMALIZATION

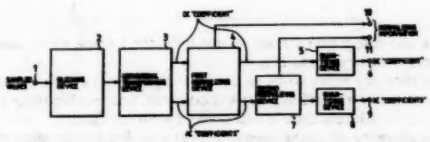
Kenji Sugiyama, Noda, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Sep. 14, 1989, Ser. No. 407,165

Claims priority, application Japan, Sep. 16, 1988, 63-233307

Int. Cl.[5] G06F *7/00, 15/00*

U.S. Cl. 364—715.02 **11 Claims**



1. A highly efficient coding system for converting electrical input digital image signals to efficiently coded electrical output signals, comprising:

a blocking means for dividing electrical input digital image signals representing sampled values into a plurality of blocks and outputting first electrical output signals representing the plurality of blocks;

an orthogonal transformation means for receiving the first electrical output signals of said blocking means corresponding to the blocks and for generating an electrical mean component signal representing a mean component of a result of an orthogonal transformation of the first electrical output signals and an electrical variation component signal representing a variation component of the result of the orthogonal transformation of the first electrical output signals;

a first normalizing means for receiving the electrical mean component signal and the electrical variation component signal and for generating second electrical output signals representing results of an interblock normalization of the electrical mean component signal and the variation component signal; and

a second normalizing means for receiving the second electrical output signals and for generating third electrical output signals representing a result of a normalization of variation components of the second electrical output signals of said first normalizing means in each of the blocks.

5,184,317

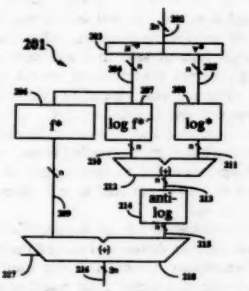
METHOD AND APPARATUS FOR GENERATING MATHEMATICAL FUNCTIONS

Lester C. Pickett, 178 Centre, Suite 21, Mountain View, Calif. 94041

Continuation of Ser. No. 366,376, Jun. 14, 1989, abandoned. This application Jan. 30, 1991, Ser. No. 623,238

Int. Cl.[5] G06F *15/32, 7/38*

U.S. Cl. 364—735 **35 Claims**



1. In an apparatus for generating an output signal which approximates a designated differentiable function of an input argument signal, said apparatus including:

means coupled to receive said input argument signal for partitioning between a most significant dominant portion and a next most significant adjunct portion;

means comprising random access memory coupled to receive said dominant portion for mapping into a primary function signal in accordance with a primary map comprising said designated function of said dominant portion;

means coupled to receive said dominant portion and said adjunct portion for mapping into a correction signal in accordance with a correction map; and

means coupled to receive said primary function signal and said correction signal for adding to produce said output signal;

an improvement wherein:

said primary map comprises said designated function of a primary combination comprising said dominant portion and a predetermined bias related to a maximum magnitude of said adjunct portion.

5,184,318

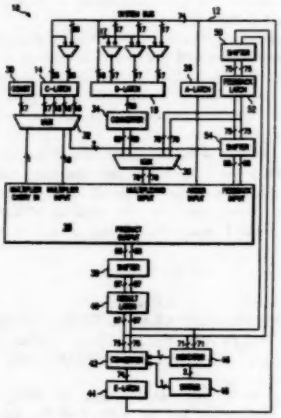
RECTANGULAR ARRAY SIGNED DIGIT MULTIPLIER

Willard S. Briggs, Carrollton, and David W. Matula, Dallas, both of Tex., assignors to Cyrix Corporation, Richardson, Tex.

Continuation of Ser. No. 402,798, Sep. 5, 1989. This application Dec. 24, 1991, Ser. No. 813,942

Int. Cl.[5] G06F *7/52*

U.S. Cl. 364—754 **6 Claims**



1. An arithmetic circuit, comprising:

a first register for storing a first operand;

a second register for storing a second operand;

a multiplier circuit having first and second inputs respectively coupled to said first and second registers, said multiplier circuit operable to generate and output a result comprising a product of said first and second operands in signed digit format, said product always being exact;

a data path coupling said output of said multiplier to said second input of said multiplier; and

a multiplexer circuit disposed in said data path, said multiplexer having a first input coupled to said second register, a second input coupled to said output of said multiplier circuit and an output coupled to said second input of said multiplier circuit,

wherein said multiplexer circuit is operable to select one of said signed digit result and said second operand to be input into said multiplier circuit, and said multiplier circuit is operable to use said signed digit result as an operand of a multiplication operation without converting said signed digit result to a non-redundant format; and

a shifter circuit disposed in said data path between said output of said multiplier circuit and said second input of said multiplexer circuit, said shifter circuit operable to shift data in said data path left a number of bit positions substantially equal to the number of bit positions of said first operand.

5,184,319

FORCE FEEDBACK AND TEXTURES SIMULATING INTERFACE DEVICE

James F. Kramer, P.O. Box 5984, Stanford, Calif. 94309

Filed Feb. 2, 1990, Ser. No. 474,168

Int. Cl.[5] B25J *3/00*

U.S. Cl. 364—806 **24 Claims**

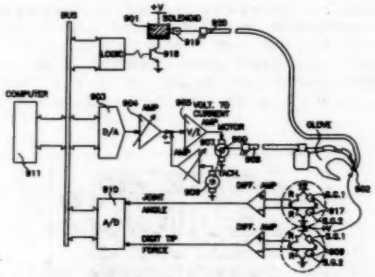
1. A device for producing a signal at a sensing body part simulating the interaction between an interactive entity and a virtual or physical object, said device comprising:

means for generating a force simulating the interaction between said interactive entity and said object; and

at least one of:

(a) means for applying said generated force between said sensing body part and a second body part which serves as a non-sensing part;

(b) means for applying said generated force to said sensing body part, said applying means comprising an entity displaced from said sensing body part in a first unactivated position and touching said sensing body part in a second activated position; and



(c) means for applying said generated force to produce a displacement of one or a plurality of texture elements, each element comprising an extendable and retractable pin or a focused fluid stream; and

(d) means for applying said generated force to a sensing body part by means of at least one elongated element guided by a housing along the surface of the body across a joint, which joint is to be affected as a result of said generated force applied to said element.

5,184,320

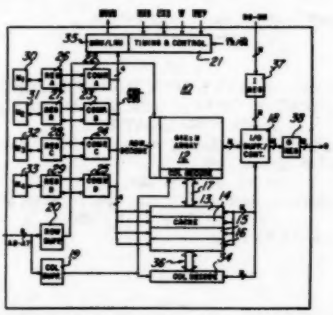
CACHED RANDOM ACCESS MEMORY DEVICE AND SYSTEM

Thomas A. Dye, Cedar Park, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 155,668, Feb. 12, 1988, abandoned. This application Feb. 21, 1990, Ser. No. 484,446

Int. Cl.[5] G11C *15/04*; G06F *12/00*

U.S. Cl. 365—49 **6 Claims**



1. An integrated circuit memory device having an on chip cache memory, comprising:

a memory array to store data, having memory cells operatively arranged in rows and columns, addressable through row address signals and column address signals;

a plurality of cache memory lines coupled to the memory array to store data, each cache memory line having its memory cells arranged in a row corresponding to a memory array row;

a circuit connected to the memory array and to the cache

memory line that is responsive to the memory address signals to determine cache hits and cache misses, the circuit including;

a register, coupled to the memory array to store row address signals;

a comparator, coupled to the register and coupled to the plurality of cache memory lines, to determine cache hits and misses by comparing a received row address signal with a prior received row address signal stored in the register, a cache hit occurring when the received row address signal matches the stored row address signal, a cache miss occurring when the received row address signal does not match the stored row address signal; and

a status register connected to the register to show whether the stored data in a cache memory line differs from the stored data in the corresponding memory array row.

5,184,321

SEMICONDUCTOR MEMORY DEVICE COMPRISING A PLURALITY OF MEMORY ARRAYS WITH IMPROVED PERIPHERAL CIRCUIT LOCATION AND INTERCONNECTION ARRANGEMENT

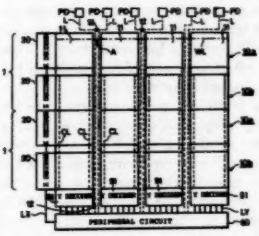
Yasuhiro Konishi; Masaki Kumanoya; Katsumi Dosaka; Takahiro Komatsu, and Yoshinori Inoue, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 437,874, Nov. 17, 1989, abandoned. This application Jan. 16, 1992, Ser. No. 821,875

Claims priority, application Japan, Dec. 6, 1988, 63-309242

Int. Cl.[5] G11C *5/06*

U.S. Cl. 365—51 **26 Claims**



1. A semiconductor memory device comprising:

a semiconductor chip;

a first memory means provided on said semiconductor chip and formed of a predetermined layers;

second memory means provided on said semiconductor chip and formed of predetermined layers;

driving circuit means comprising a peripheral circuit provided on said semiconductor chip for driving said first and second memory means, said first and second memory means being arranged in a common column on one and the other sides of said driving circuit means, respectively;

one ore more pads provided on said semiconductor chip for receiving externally applied signals and predetermined potentials, said driving circuit means and the pads are all arranged in said common column; and

interconnecting means, including interconnections formed of a layer other than said predetermined layers, for interconnecting said pads and said driving circuit mean; wherein

said interconnections are provided so as to cross one of said first and second memory means, whereby no additional chip area is required to form said interconnections,

said first memory means includes a first memory array,

said second memory means includes a second memory array,

each of said first and second memory arrays includes a plurality of memory cells arranged in a plurality of columns and in a plurality of rows, a plurality of word lines provided corresponding to said plurality of rows and each connected to the memory cells belonging to the corresponding row, and a plurality of bit lines provided corresponding to said plurality of columns and each connected to the memory cells belonging to the corresponding column,

each of said first and second memory arrays is divided with predetermined spacings into a plurality of blocks so as to divide each of said plurality of word lines at a plurality of points, and

said interconnections are provided so as to cross said first and second memory arrays in said predetermined spacing region between said plurality of blocks; and

further including a plurality of low resistance lines provided above said plurality of word lines in parallel thereto, each of said plurality of low resistance lines being connected to the corresponding word line at said plurality of points.

5,184,322

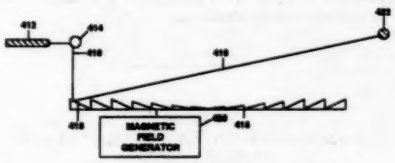
OPTICAL STORAGE DEVICE WITH A STATIONARY MASS STORAGE MEDIUM

Nathan Okun, 1735 Callas Ct., Oxnard, Calif. 93035, and John Engberg, 2855 Harbor Blvd., Ventura, Calif. 93001

Filed Jan. 29, 1990, Ser. No. 471,765

Int. Cl.[5] G11C *13/06, 13/04, 7/00;* **G11B** *13/00*

U.S. Cl. 365—122 **10 Claims**



1. A data storage device comprising:

a. a laser scanning device means for emitting a scanning laser beam,

b. a mass storage medium which remains stationary as data is transferred by said laser scanning means from said mass storage medium, and

c. a staring array receiver for receiving said data from said mass storage medium by said scanning laser beam,

d. wherein, said mass storage medium remains stationary while said data is located by said laser scanning means.

5,184,323

PHOTOREFRACTIVE DEVICE AND PROCESS FOR ITS USE

Jay S. Schildkraut; Ralph H. Young, both of Rochester; David J. Williams, Fairport, and Michael Scozzafava, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 491,398, Mar. 9, 1990, Pat. No. 4,999,809. This application Jul. 5, 1990, Ser. No. 548,403

The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

Int. Cl.[5] G11C *13/04, 11/42*

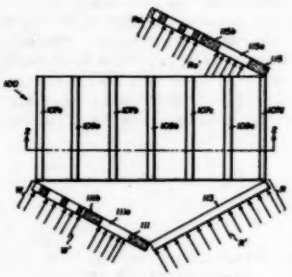
U.S. Cl. 365—124 **11 Claims**

1. An imaging array consisting of a plurality of photorefractive devices connected electrically in parallel, each said photorefractive device being comprised of:

first and second electrical biasing means for establishing a potential gradient between first and second spaced locations and, interposed between said first and second electrical biasing means;

intermediate means capable of optically coupling two spatially intersecting beams of electromagnetic radiation when a potential gradient is applied to said intermediate means by said first and second electrical biasing means; and

characterized in that said intermediate means consists of a photorefractive medium comprised of a homogeneous



charge neutral organic photoconductor containing organic noncentrosymmetric molecular dipoles capable of imparting to said photorefractive medium a second order polarization susceptibility of greater than 10^{-9} esu, said molecular dipoles each containing an electron donor moiety linked through a conjugated π bonding system to an electron acceptor moiety.

5,184,324

DYNAMIC SEMICONDUCTOR MULTI-VALUE MEMORY DEVICE

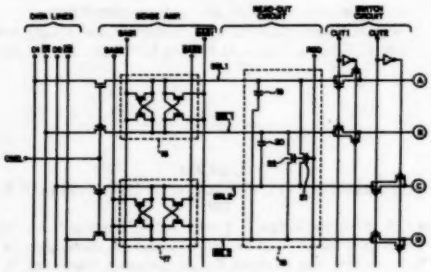
Yoshiji Ohta, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Jul. 5, 1991, Ser. No. 727,233

Claims priority, application Japan, Dec. 20, 1990, 2-403964

Int. Cl.[5] G11C *5/10*

U.S. Cl. 365—149 **4 Claims**



1. In a dynamic semiconductor memory device comprising: memory cells each for storing multi-value data; and a plurality of bit line pairs of first and second bit lines, said first and second bit lines being complementary to each other, said memory device further comprises:

first capacitor means connected between the first bit line of one of said bit line pairs and the second bit line of another one of said bit line pairs, said other one bit line pair being adjacent to said one bit line pair; and

second capacitor means connected between the second bit line of said one bit line pair and the first bit line of said other one bit line pair.

5,184,325

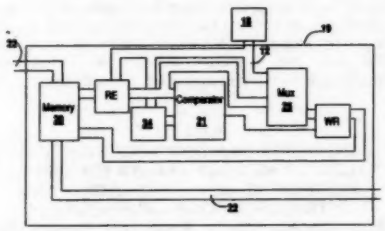
DYNAMIC ASSOCIATIVE MEMORY WITH LOGIC-IN-REFRESH

G. Jack Lipovski, Austin, Tex., assignor to Board of Regents, The University of Texas System, Tex.

Continuation-in-part of Ser. No. 321,847, Mar. 10, 1989, Pat. No. 4,989,180. This application Sep. 5, 1990, Ser. No. 577,991

Int. Cl.[5] G11C *11/406, 11/402, 15/00*

U.S. Cl. 365—189.07 **14 Claims**



1. A data storage device comprising:

dynamic data storage means, integrated on a single semiconductor chip, for storing a plurality of multiple bit data words in addressable predetermined multiple bit word storage locations, said multiple bit word storage locations requiring refreshing in order to retain data;

addressing circuit means integrated on said single chip for periodically addressing each of said data bit storage locations;

refresh circuit means, integrated on said single chip and randomly connectable by said addressing circuit means to each of said multiple bit word storage locations, for periodically refreshing each of said multiple bit words in said adjacent storage locations; and

logic means, including data comparator means integrated on said single chip and connected to said refresh circuit means, for comparing each bit of a predetermined comparand with each corresponding bit of each said data word stored in said predetermined word storage locations, whereby each data word bit addressed by said addressing circuit means can be searched, and for providing an indication of a match between said bits of said comparand and the corresponding bits of at least one of said data words.

5,184,326

INTEGRATED SEMICONDUCTOR MEMORY OF THE DRAM TYPE AND METHOD FOR TESTING THE SAME

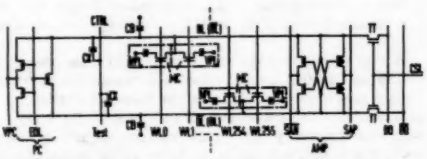
Kurt Hoffmann, Taufkirchen; Rainer Kraus, München, and Oskar Kowarik, Grafing, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 15, 1990, Ser. No. 494,122

Claims priority, application European Pat. Off., Mar. 16, 1989, 89104715.1

Int. Cl.[5] G11C *7/00*

U.S. Cl. 365—201 **28 Claims**



1. Integrated semiconductor memory of the DRAM type, comprising word lines, bit line pairs, memory cells in a matrix being connected to said word lines and said bit lines, a plurality of sense amplifiers, each sense amplifier being connected to a

respective bit line pair, each of said bit line pairs being divided into one bit line and one reference bit line, a control line, at least one first coupling capacitor for each of said bit lines, and at least one second coupling capacitor for each of said reference bit lines, each of said coupling capacitors having a first lead connected to a respective line of said bit line pairs and a second lead connected to said control line, means for applying a fixed potential to said control line when operating said semiconductor memory in a normal operating mode, and means for applying via said first and second coupling capacitor a test signal to said bit line pairs when operating said semiconductor memory in a test operating mode.

5,184,327

SEMICONDUCTOR MEMORY DEVICE HAVING ON-CHIP TEST CIRCUIT AND METHOD FOR TESTING THE SAME

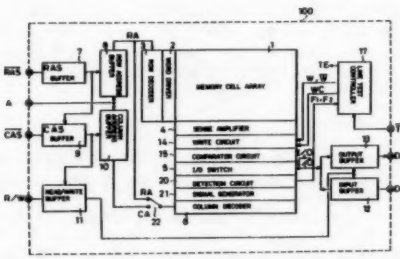
Yoshio Matsuda; Kazutami Arimoto; Tsukasa Ooishi; Masaki Tsukude, and Kazuyasu Fujishima, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 532,338, Jun. 5, 1990. This application Jul. 9, 1991, Ser. No. 727,218

Claims priority, application Japan, Jun. 14, 1989, 1-152653

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—201 **9 Claims**



1. A method for testing a semiconductor memory device comprising a plurality of word lines, a plurality of bit lines arranged for intersecting said word lines, a plurality of memory cells arranged at points of intersection of said word lines and said bit lines, a plurality of detection means, and an output line, said method comprising the steps of

sequentially selecting said word lines,

detecting a possible failure of said memory cells connected to the selected word line by said detection means,

applying detection results by said detection means to junction points of said output line,

sequentially selecting portions between predetermined ones of said junction points of said output line in correspondence with word line selection and dividing said output line into at least two parts at the selected portion, and

monitoring detection results applied to the respective divided parts of said output line and finding out a portion at which a detection result is changed in each divided part of said output line.

5,184,328

UNDERWATER RELEASE MECHANISM

Alex Dumestre, III, Covington, La., assignor to Navigation Technology Corporation, Covington, La.

Filed Mar. 4, 1992, Ser. No. 846,005

Int. Cl.[5] H04B *1/59;* **B63B** *22/06, 22/26*

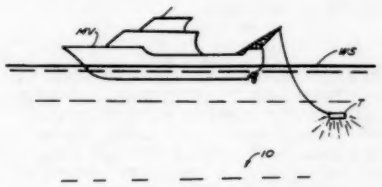
U.S. Cl. 367—4 **18 Claims**

1. An underwater acoustic release mechanism for use in high hydro-static pressures, comprising:

a) a housing;

b) a spool section of the housing for carrying a length of rope for extension between the sea surface area and an underwater location;

c) a release module carried by the housing and including a connector that can engage an end portion of the rope so that it will not unwind from the spool section;



d) means for releasing the connector from engagement with the rope and comprising in part a meltable substance that can expand upon melting; and

e) linkage means for translating an expansion of the meltable substance into movement of the connector.

5,184,329

METHOD AND DEVICE FOR OPTIMIZING THE TRIGGERING OF AN ARRAY OF MARINE SEISMIC SOURCES

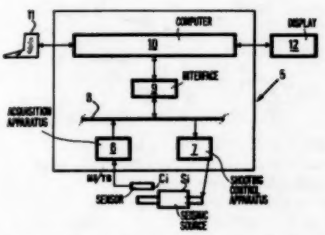
Alain Regnault, Antony; Jacques Cretin, le Chesnay, and Pascal Froidevaux, Paris, all of France, assignors to Institut Francais de Petrole, Rueil-Malmaison and Compagnie Generale de Geophysique, Massy, both of, France

Filed Jun. 28, 1991, Ser. No. 723,391

Claims priority, application France, Jun. 29, 1990, 90 08267

Int. Cl.[5] G01V *1/38;* **H04R** *1/02*

U.S. Cl. 367—23 **9 Claims**



1. A method of optimizing the triggering of each seismic source within an array of marine seismic sources being towed in immersion by a ship and under control of a shooting control system to manage the triggering times of the seismic sources in order to obtain determined phase shifts between the impulses respectively emitted by the different seismic sources while updating the triggering time shifts to be applied to the different seismic sources to take into account the alteration over time of the working conditions of each seismic source, said method comprising the steps of:

acquiring and digitizing during a determined time interval at least one signal picked up close to each one of the seismic sources due to its triggering, and storing each digitized signal,

comparing for each seismic source the form of each stored signal, including at least one of the frequency spectra of the stored signal, the R. M. S. value of the stored signal, and the energy level of the stored signal per period of time, with a reference signal associated with the respective seismic source as stored in a first table of previously acquired data relating to the seismic sources, to ascertain whether said seismic source has worked properly,

validating the stored signals of those seismic sources ascertained to have worked properly;

updating the reference signals stored in the first table by incorporating the validated signals therein;

determining the optimum triggering times of the different seismic sources in accordance with the updated reference signals; and

triggering the different seismic sources at the determined optimum triggering times.

5,184,330

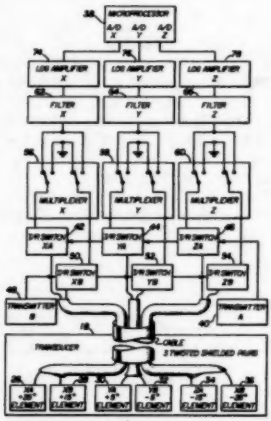
MULTI-BEAM SONAR FISH DETECTION APPARATUS PROVIDING REAL-TIME THREE-DIMENSIONAL WIRE-FRAME DISPLAY REPRESENTATION

James W. Adams, Eufaula; Louis S. Loving, Clayton; David A. Betts, Eufaula; David P. Donnelly, Eufaula, and Alvin Nunley, III, Eufaula, all of Ala., assignors to Techsonic Industries, Inc., Lake Eufaula, Ala.

Filed Jun. 25, 1991, Ser. No. 720,644

Int. Cl.[5] G01S *15/96*

U.S. Cl. 367—111 **7 Claims**



1. A sonar depth sounder apparatus comprising:

a transducer with at least two elements, which produce a series of sonar signals, wherein the elements emit sonar signals toward the bottom surface of a body of water;

at least two receivers capable of receiving returned sonar signals which have been reflected back toward the transducer elements by the bottom surface of the body of water;

a microprocessor for analyzing the returned sonar signals and generating information regarding the contour of the bottom surface of the body of water; and

a visual display for displaying the information regarding the contour of the bottom surface of the body of water, wherein said display is capable of depicting a plurality of different three-dimensional views of the bottom surface of the body of water.

5,184,331

TRANSDUCER CIRCUIT FOR REMOVING REACTIVE COMPONENT OF TRANSDUCER SIGNAL

Michael J. Sullivan, Oakdale, and Douglas G. Dussault, East Lyme, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1992, Ser. No. 891,120

Int. Cl.[5] H04B *1/06*

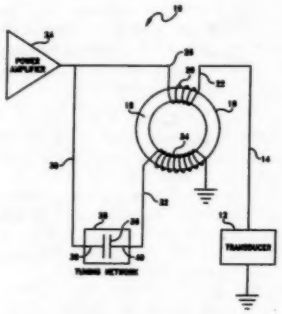
U.S. Cl. 367—135 **6 Claims**

1. A transducer circuit comprising:

an acoustic transducer having an output lead carrying an alternating current signal having a substantial reactive component that varies with frequency;

an inductor having a core with a primary winding, one end of which is connected to the said output lead;

a power amplifier to which the other end of the inductor winding is connected;



a control circuit having an input lead that is connected to the said other end of the primary winding; and

a secondary winding on the inductor core to which the control circuit output lead is connected, which winding operates in bucking relationship to the primary winding, so that the power amplifier is tuned to the transducer over a wide range of frequencies.

5,184,332

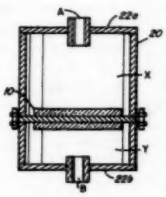
MULTIPORT UNDERWATER SOUND TRANSDUCER

John L. Butler, Marshfield, Mass., assignor to Image Acoustics, Inc., Cohasset, Mass.

Filed Dec. 6, 1990, Ser. No. 623,342

Int. Cl.[5] H04R *17/00*

U.S. Cl. 367—162 **57 Claims**



1. An underwater sound transducer comprising;

a hollow closed housing enclosing a volume including at least two resonant chambers,

a vibrating member having a first surface and a second surface,

said vibrating member being disposed within said housing and at least partially defining said resonant chambers with said first surface of said vibrating member facing said first resonant chamber and said second surface of said vibrating member facing said second resonant chamber,

first and second resonating means for respectively coupling said first and second resonant chambers to the area outside of said housing,

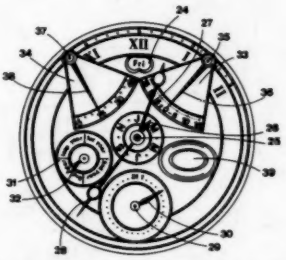
said first and second resonating means set to resonate at slightly different frequencies and producing an additive output at frequencies between said slightly different frequencies,

in combination with a liquid environment in which the resonating means operate to direct acoustic signals into the liquid.

5,184,333
CLOCK MOVEMENT

Michel Caspar, Le Sentier, Switzerland, assignor to Montres Breguet S.A., Le Brassus, Switzerland

Filed Mar. 31, 1992, Ser. No. 860,978
Claims priority, application Switzerland, Apr. 17, 1991, 1151/91
Int. Cl.[5] G04B *19/24*
U.S. Cl. 368—28 6 Claims

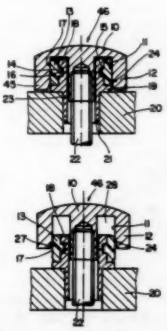


1. A clock movement comprising a first perpetual calendar mechanism and a second equation-of-time mechanism, said movement further comprising a third mechanism including means, cooperating with said perpetual calendar mechanism and said equation-of-time mechanism, for perpetually displaying the difference between the civil time, displayed by the first mechanism, and the true time.

5,184,334
SEALED CONTROL ARRANGEMENT FOR A TIMEPIECE

Alfred Vollert, La Chaux-de-Fonds, Switzerland, assignor to Fabrique Ebel SA, La Chaux-de-Fonds, Switzerland

Filed Nov. 26, 1990, Ser. No. 617,647
Claims priority, application France, Nov. 27, 1989, 89 15690
Int. Cl.[5] G04B *29/00*
U.S. Cl. 368—319 8 Claims



1. A sealed control arrangement for a timepiece, said sealed control arrangement being lodged in a case and including a crown rotatable about a tube projecting from said case, a stem extending into said tube, said stem being movable between at least two axial positions including a neutral pushed-in position and an active drawn-out position, said crown comprising a head integrally formed with a central cylindrical portion that is fastened to said stem, said head being integrally formed with a lateral skirt concentric with said central cylindrical portion and outwardly spaced therefrom so as to form an annular housing between said central cylindrical portion and an internal wall of said skirt, said internal wall exhibiting a cylindrical wall surface having a constant diameter over its entire height, said annular housing being shaped to receive said tube; a packing in the form of an annular bandage compressed between said tube and said internal wall, said packing having an external portion shaped such that a lower edge of said internal wall of said skirt is always in contact with said external portion of said packing regardless of the axial position of said stem, said tube having an annular groove and said packing having an annular projection on an internal portion thereof which penetrates into said annular groove to prevent movement of said packing relative to said tube as said stem is moved.

5,184,335
METHOD AND SYSTEM FOR ERASING PREVIOUSLY RECORDED DOMAINS IN A MAGNETO-OPTIC RECORDING MEDIUM

Mark H. Kryder, Allegheny, and Han-Ping D. Shieh, Pittsburgh, both of Pa., assignors to Movid Information Technology, Inc., Schenectady, N.Y.

Continuation of Ser. No. 279,255, Nov. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 33,931, Apr. 4, 1987, abandoned, which is a continuation of Ser. No. 837,130, Mar. 19, 1986, abandoned. This application May 10, 1991, Ser. No. 700,882
Int. Cl.[5] G11B *13/04, 11/10, 11/12*
U.S. Cl. 369—13 31 Claims

1. A method of selectively modifying information stored in a small region of a recording medium in a magneto-optic disk comprising the steps of:

providing a thin-film layer of ferrimagnetic material as said recording medium having a compensation temperature a few tens of degrees centigrade above room temperature;

creating said small region in said recording medium surrounded by a magnetic domain wall, said small region having a direction of magnetization opposite to the direction of magnetization in the region immediately outside said magnetic domain wall;

associating the information with an existing direction of net magnetization of said small region at ambient temperature; and

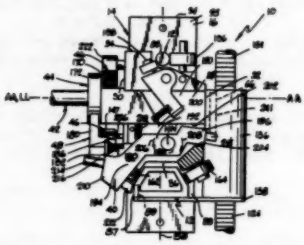
irradiating said small region with a beam of energy, said beam imparting sufficient energy to said small region to temporarily raise the temperature of at least part of said small region above said compensation temperature to cause self inversion of the direction of net magnetization exhibited by at least a portion of said small region after cooling to ambient temperature without requiring the use of both external magnetic bias field and internal biasing layer to erase said small region in said medium, whereby the information stored in said small region is modified.

5,184,336

MECHANICAL ASSEMBLY FOR ALTERNATELY PRODUCING DISPLACEMENT OF A CARRIAGE AND ROTATION OF A CARRIAGE MOUNTED GEAR

Mark E. Wanger; Jennifer L. Methlie; Donald J. Stavely, and Thomas C. Oliver, all of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 298,388, Jan. 18, 1989, Pat. No. 5,101,387. This application Dec. 13, 1991, Ser. No. 808,268
The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.
Int. Cl.[5] G11B *17/22*
U.S. Cl. 369—34 **6 Claims**



1. A mechanical assembly for clutchlessly alternately producing displacement of a carriage with respect to a carriage track and rotation of a gear mounted on the carriage, in response to torque provided from a single drive motor comprising:

a) latching means, having a latched state and an unlatched state, operably associated with said carriage for latchingly preventing relative movement between said carriage and said track during said latched state;

b) locking means, having a locked state and an unlocked state, operatively associated with said gear for lockingly preventing relative rotation of said gear during said locked state.

5,184,337

OPTICAL RECORDING/REPRODUCING APPARATUS HAVING MEANS FOR PERIODICALLY SUPERVISING DRIVE CURRENT SUPPLIED TO ACTUATOR

Takao Rokutan, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1991, Ser. No. 716,878
Claims priority, application Japan, Jun. 19, 1990, 2-162436
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—44.25 **22 Claims**

1. An optical recording/reproducing apparatus comprising:

condensing means for condensing a beam spot, which is used to record or reproduce information to and from an optical recording medium having a plurality of tracks, onto said optical recording medium;

displacement means for displacing at least a portion of said condensing means with respect to said optical recording medium in at least either direction in which a focal point is adjusted or a direction which transverses said track;

drive means for supplying a drive current to said displacement means;

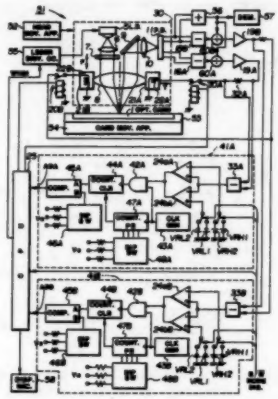
cutting means for cutting said drive current;

comparison means for detecting whether or not said drive current output from said drive means exceeds a predetermined range;

counting means for counting the number of times at which said comparison means has determined that said drive current output from said drive means exceeds said predetermined range, said counting being made in a predetermined supervisory period at every detection time the interval of which is shorter than said supervisory time;

determination means for determining whether or not a counted value counted by said counting means exceeds a reference number; and

control means for cutting said drive current by operating said cutting means in accordance with a determination signal denoting a fact that a determination has been made by said determination means that said counted value exceeds said reference number.

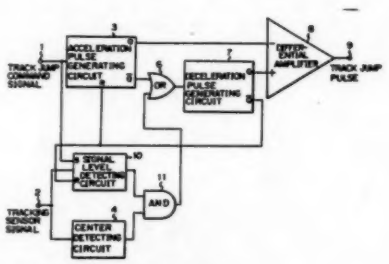


5,184,338

OPTICAL DISC SYSTEM WITH IMPROVED TRACK JUMPING OPERATION

Kyouzi Shimoda, and Kyosuke Yoshimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 199,471, May 27, 1988, abandoned.
This application Feb. 13, 1991, Ser. No. 655,181
Claims priority, application Japan, Jun. 25, 1987, 62-156470
Int. Cl.[5] G11B *7/085*
U.S. Cl. 369—44.25 **3 Claims**



1. An optical disc system having:

tracking actuator means for positioning a light spot on an optical disc in a radial direction thereof;

photodetector means for generating a trackigns ensor signal to detect off-track information with respect to the position of said light spot on said optical disc;

circuit means for causing said tracking actuator means to jump said light spot from its present position on a track to a position on an adjacent track;

acceleration pulse generating means for generating a signal to cause acceleration of said tracking actuator means during a track jumping operation;

deceleration pulse generating means for generating a signal to cause deceleration of said tracking actuator means during said track jumping operation; and

center detecting means for detecting when the said light spot

is at the midpoint between adjacent tracks in response to a zero crossing point of said trackign sensor signal,

said optical disc system characterized by including switching means responsive to an output signal of said center detecting means for switching control from said acceleration pulse means to said deceleration pulse means after a period of time has elapsed from the start of said track jumping operation, so that a false detection of the zero crossing point of said tracking sensor signal is prevented during said time period,

signal level detecting circuit means responsive to said tracking sensor signal and having a detection level which is smaller than the level which corresponds to the maximum amplitude of said tracking sensor signal, whereby said time period is provided by the time period required for said tracking sensor signal to reach said detection level from the start of said track jumping operation.

5,184,339

INFORMATION RECORDING-REPRODUCING HEAD DRIVING CIRCUIT

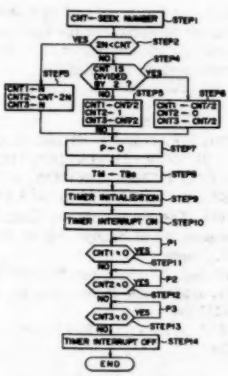
Keiji Tsuchiya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1991, Ser. No. 707,781

Claims priority, application Japan, May 31, 1990, 2-143725

Int. Cl.[5] G11B *7/085*

U.S. Cl. 369—44.280 **3 Claims**



1. An information recording-reproducing head driving circuit for moving an information recording-reproducing head from a current position on a recording medium to a desired position while velocity-controlling the head, including:

a pulse motor for moving the information recording-reproducing head relative to the recording medium;

a timer for counting down a count value set to determine the driving timing of said pulse motor; and

control means for calculating the count value on the basis of a predetermined time table and for setting the count value in said timer, and for generating a driving pulse for said pulse motor when said timer has counted down the count value,

said control means subtracting a desired value extracted from said time table from the count value set in said timer the last time to thereby accomplish the calculation of a new count value.

5,184,340

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING INFORMATION ON AN OPTICAL MEDIUM

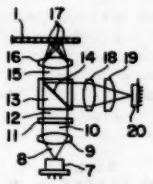
Kenjiro Kachi, Tsurugashima, and Kazuo Noda, Yokohama, both of Japan, assignors to Nippon Coulux Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,603

Claims priority, application Japan, Oct. 23, 1987, 62-266212

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.37 **10 Claims**



1. A method for recording and reproducing information recorded on an optical recording medium, said medium having at least one information track and at least two guiding tracks positioned on both sides of the information track respectively, comprising:

irradiating a light spot for recording and reproducing information on the information track and a plurality of light spots for tracking on the guiding tracks of the optical recording medium, respective parts of said plurality of light spots irradiating the guiding tracks;

projecting reflected beams from the optical recording medium responding to said light spots on photosensor having a photosensor for detecting information and at least two photosensors for detecting guiding tracks;

the reflected beam from the information track being projected on said photosensor for detecting information and the reflected beam from said guiding tracks being projected on said photosensors for detecting the guiding tracks; and

producing two outputs from a plurality of electrical outputs of said photosensors for tracking to provide tracking-control signals.

5,184,341

INFORMATION RECORDING METHOD HAVING SUCCESSIVE DATA WRITE AND DATA VERIFY OPERATIONS

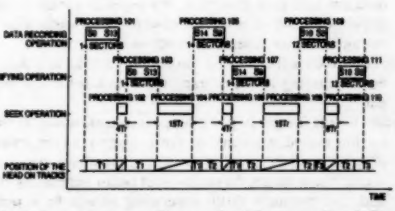
Hiroshi Hamasaka, Nishinomiya; Isao Satoh, Neyagawa, and Yoshihisa Fukushima, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 28, 1990, Ser. No. 486,099

Claims priority, application Japan, Mar. 3, 1989, 1-52287; Mar. 23, 1989, 1-70866

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—54 **5 Claims**



1. An information recording method for recording information on a recording medium having a spiral track structure

which is divided into a plurality of sectors, said method comprising:

a first step of conducting a data write operation for recording data on N sectors along said spiral track structure of said recording medium, N being a positive integer;

a second step of conducting a data verifying operation for verifying the correctness of said data previously recorded on said N sectors along said spiral track structure in said first step;

where N is obtained by subtracting a number of sectors across which a recording head is conveyed relative said recording medium during a time period required for changing from said data write operation to said data verifying operation from a number, or a multiple of a number, of sectors contained in one track;

a third step of repeated and sequentially carrying out said first and second steps until a completion of said recording of information on said recording medium.

5,184,342

INFORMATION PROCESSING DEVICE

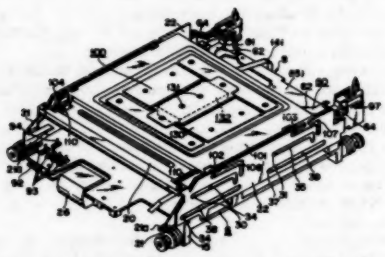
Masaru Ishii, Kamakura, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 14, 1991, Ser. No. 699,713

Claims priority, application Japan, May 15, 1990, 2-125170

Int. Cl.[5] G11B *23/00, 13/04*

U.S. Cl. 369—100 **23 Claims**



1. A device for storing information in an information storage medium by directing a light beam with a magnetic field applied to the information storage medium, comprising:

light beam generating means for generating the light beam;

magnetic field generating means for generating the magnetic field;

housing means for housing the light beam generating means and magnetic field generating means, the housing means having an access hole through which the information storage medium is inserted;

support means for supporting both the information storage medium inserted via the access hole into the housing means and the magnetic field generating means such that the information storage medium and magnetic field generating means are movable along the storage medium insertion direction, and in a direction included to the storage medium insertion direction, the support means being so provided at the housing means as to be movable along the storage medium insertion direction;

movable means for moving the support means in a direction corresponding to the storage medium insertion direction; and

guide means for guiding the support means, which is moved by the movable means, in the storage medium insertion direction and for guiding the storage medium to a position where the medium faces the light beam generating means and the magnetic field generating means to a position where the magnetic field generating means faces the light beam generating means through the storage medium.

5,184,343

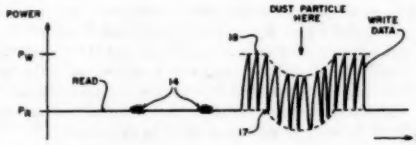
COMPENSATION FOR DUST ON AN OPTICAL DISK BY INCREASING LASER WRITING POWER

Donald F. Johann, 3724 Carlson Cir., Palo Alto, Calif. 94306, and Alan C. Burroughs, 851 Arnold Way, San Jose, Calif. 95128

Filed May 6, 1991, Ser. No. 696,230

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—116 **17 Claims**



1. In a system employing a focussed laser beam to record information on an optical storage medium, an apparatus which compensates for the presence of a contaminate particle or defect on the surface of said medium during the writing of data, said apparatus comprising:

means for sensing the reflected laser light back from said medium;

means for detecting, during a write operation, that the power of said reflected laser light has been reduced due to the presence of said particle or defect on said surface, said detection means including a means for generating a representation of the average read power level of said reflected light, and a means for comparing the instantaneous read power level with said average read power level of said reflected light, the difference being proportional to the reduction in reflected laser power due to said particle or defect; and

means for increasing the power of said laser beam by an amount sufficient to overcome the light power reduction effects of said particle or defect such that said data is effectively recorded on said medium.

5,184,344

RECORDING HEAD INCLUDING ELECTRODE SUPPORTING SUBSTRATE HAVING THIN-WALLED CONTACT END PORTION, AND SUBSTRATE-REINFORCING LAYER

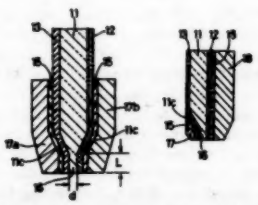
Yukihisa Takeuchi; Toshikazu Hirota; Shigeki Okada, and Natsumi Shimogawa, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Aug. 20, 1990, Ser. No. 570,302

Claims priority, application Japan, Aug. 21, 1989, 1-214624; Sep. 28, 1989, 1-253504

Int. Cl.[5] G01D *15/06;* **B41J** *3/20, 3/00*

U.S. Cl. 369—126 **17 Claims**



1. A recording head operable to apply an electric current to an electrically resistive layer provided on one of a recording medium and a planar intermediate member, said planar intermediate layer being interposed between the recording medium and the recording head, said recording head having an electrically insulating ceramic substrate, at least one recording electrode formed on one of two opposite major surfaces of said

substrate, and at least one return circuit electrode formed on the other major surface of the substrate, said recording head including an operating end at which said substrate and said electrodes are held together in direct contact with said one of the recording medium and the planar intermediate member, so that the electric current is applied to said electrically resistive layer, wherein the improvement comprises:

said substrate being formed of a material whose wear resistance is lower than that of said recording and return circuit electrodes, and includes a proximal portion, and a thin-walled distal end portion extending from the proximal portion by a predetermined length for contact with said one of the recording medium and the planar intermediate member, the distal end portion having a constant thickness, between electrodes, smaller than that of the proximal portion, as viewed in a direction perpendicular to a direction of extension of the distal end portion;

said substrate having a recessed portion formed in at least one of said opposite major surfaces such that said recessed portion at least partially defines said thickness of said distal end portion; and

a reinforcing layer disposed to reinforce said thin-walled distal end portion, such that at least a portion of said reinforcing layer is positioned in said recessed portion.

5,184,345

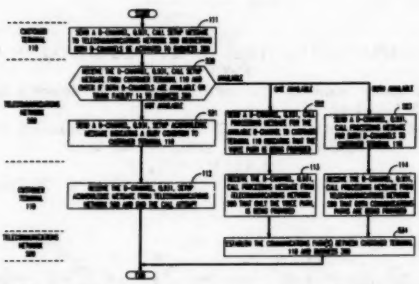
ENHANCED ISDN 800 SERVICE

Paramdeep S. Sahni, Marlboro, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 2, 1991, Ser. No. 636,812

Int. Cl.[5] H04J *3/12*; H04M *11/06*

U.S. Cl. 370—54 **22 Claims**



6. A method for providing a second communications path between a calling party and a called party through a telecommunications network, the method comprising the steps of:

receiving a network address of the calling party from the telecommunications network at a location of the called party as a result of establishing a first communications path between the calling party and the called party through the telecommunications network, the calling party network address identifying the calling party's location in the telecommunications network;

providing audio information to the calling party on the first communications path through the telecommunications network;

sending an ISDN message to the telecommunications network, the ISDN message including a request to establish the second communications path to the calling party's location, the request including the calling party network address;

receiving an ISDN message from the telecommunications network that the second communications path is being provided; and

providing image information on the second communications path to the calling party, where the image information is exchanged concurrently with the audio information.

5,184,346

SWITCHING SYSTEM

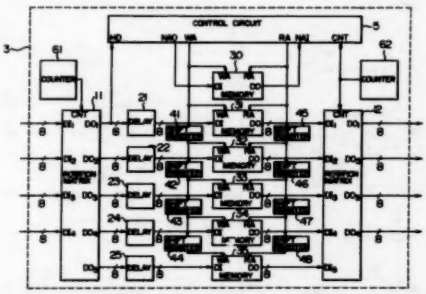
Takahiko Kozaki, Koganei; Kenichi Asano, Akishima; Mineo Ogino, Hanno; Eiichi Amada, Tokyo, all of Japan; Noboru Endo, Freehold, N.J., and Yoshito Sakurai, Yokohama, Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corporation & Link Laboratory Inc., both of Tokyo, Japan

Filed May 21, 1990, Ser. No. 526,381

Claims priority, application Japan, May 31, 1989, 1-136032

Int. Cl.[5] H04Q *11/04*; H04J *03/24*

U.S. Cl. 370—60 **21 Claims**



1. A switching system for a cell of a fixed length having plural units of data, at least one unit including a header portion and remaining units including a data portion, the cell being inputted to a first incoming highway of incoming highways, to exchange communication information between the first incoming highway and a first outgoing highway of plural outgoing highways based upon information contained in said header portion, comprising:

first switching means including a plurality of input terminals and a plurality of output terminals, a first input terminal of said input terminals being connected to the first incoming highway, for sequentially connecting each of the input terminals to each of the output terminals for every one unit of the data in the fixed length cell, and for sequentially outputting continuous data at predetermined bit positions of the plurality of output terminals to a corresponding sequence of a plurality of memory means;

each of the plurality of memory means including means for storing data from at least one of said plural output terminals of said first switching means in response to a write address, and for reading the stored data in response to a read address;

address generating means for outputting said write address and read address in response to the header portion of the cell outputted from said first switching means;

first shift means for applying the write address derived from said address generating means to said plurality of memory means while timing said first shift means application the continuous output of data of the cell such that the plural units of data of the cell appearing on the first incoming highway are written at an identical address at each of said plurality of memory means;

second switching means including a plurality of input terminals connected to each of corresponding outputs of said plurality of memory means, and a plurality of output terminals corresponding to the plural outgoing highways, for sequentially connecting each of the input terminals to each of the plurality of output terminals to output every unit of data of the cell from each of said plurality of memory means to said first outgoing highway of said plurality of outgoing highways through a first output terminal; and,

second shift means for applying the read address derived from said address generating means to said plurality of memory means while timing said second shift means application with the output of the data of the cell read out from said plurality of memory means to allow output from the second switching means.

5,184,347

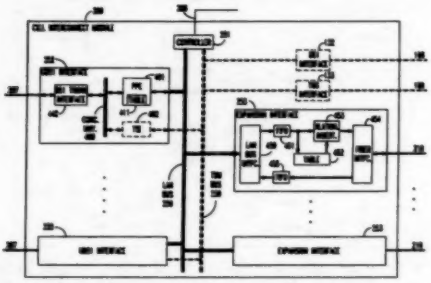
ADAPTIVE SYNCHRONIZATION ARRANGEMENT

Charles Y. Farwell, Denver; Michel L. Hearn, Broomfield; Richard M. Heidebrecht, Boulder, all of Colo.; Kelvin K. Ho, Somerset, N.J., and Douglas A. Spencer, Boulder, Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 9, 1991, Ser. No. 727,491

Int. Cl.[5] H04L *7/00*

U.S. Cl. 370—94.1 **46 Claims**



1. An apparatus comprising:

a first operating unit having its operations synchronized with first clock signals;

a second operating unit having its operations synchronized with second clock signals which are asynchronous with the first clock signals;

a third operating unit for interfacing the operations of the first unit with the operations of the second unit, the third unit having its operations nominally synchronized with the operations of the first unit;

means for monitoring an extent of asynchrony between the operations of the second and the third units, to determine whether the extent of asynchrony lies outside of a predetermined range of allowed asynchrony; and

means responsive to a determination that the extent of asynchrony does lie outside of the predetermined range, for adjusting the synchronization of the operations of the third unit with the operations of the first unit, to move the extent of asynchrony between the operations of the second and the third units to within the range.

5,184,348

ISND MULTIPROTOCOL COMMUNICATIONS CONTROLLER

Najib Abdelmouttalib, Conflans-Sainte-Honorine, and Didier Duflot, Issy-Les-Moulineaux, both of France, assignors to Bull, S.A., France

Filed Dec. 20, 1989, Ser. No. 453,581

Claims priority, application France, Dec. 27, 1988, 88 17208

Int. Cl.[5] H04J *3/12*

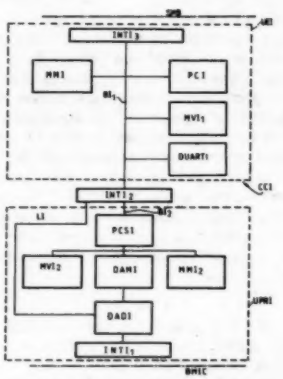
U.S. Cl. 370—95.1 **29 Claims**

22. An ISDN multiprotocol communications controller for controlling at least one communications link supported physically by a transmission line terminated at data circuit terminating equipment and having a specific number of data channels controlled according to a multiplicity of protocols, between at least one computer and a set of terminals through an automatic telephone branch exchange, comprising:

a basic controller for receiving data coming from the computer and the terminals via an S_2 link and controlling upper layers of an OSI communications model; and

a peripheral device disposed in series between the basic controller and the data circuit terminating equipment, for controlling communications between the computer and the terminals, including:

a signal processor connected to the basic controller and having a programmable memory containing programs for processing the multiplicity of protocols used in the S_2 link; and



means connected to the data circuit terminating equipment, for dynamically allocating time-division data channels corresponding to the data channels of the communication link.

5,184,349

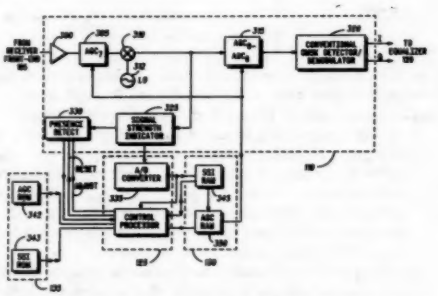
AMPLITUDE CONTROL OF A BURST SIGNAL IN A RECEIVER

Kenneth B. Riordan, Wauconda, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 642,253, Jan. 16, 1991, abandoned. This application Aug. 21, 1992, Ser. No. 933,611

Int. Cl.[5] H04B *7/212*

U.S. Cl. 370—95.3 **20 Claims**



1. A receiver module in a time-division multiple access (TDMA) communication system for controlling the amplitude of a randomly received burst signal, the randomly received burst signal being input into the receiver module during the time of one TDMA timeslot, the receiver module comprising:

means for storing amplitude control values related to continuous signal amplitudes;

means for detecting when during the TDMA timeslot time the randomly received burst signal arrives;

means, responsive to said means for detecting, for monitor-

ing the amplitude of said randomly received burst signal for at least one predetermined time period of the TDMA timeslot;

means, coupled to said means for storing and responsive to said means for monitoring, for selecting an amplitude control value corresponding to the amplitude of said randomly received burst signal; and

means, responsive to said selected amplitude control value, for controlling the amplitude of said randomly received burst signal after at least said one predetermined time period.

5,184,350

TELEPHONE COMMUNICATION SYSTEM HAVING AN ENHANCED TIMING CIRCUIT

Paul S. Dara, Broken Arrow, Okla., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 17, 1991, Ser. No. 686,645

Int. Cl.[5] H04J *3/06*

U.S. Cl. 370—105.3 **17 Claims**

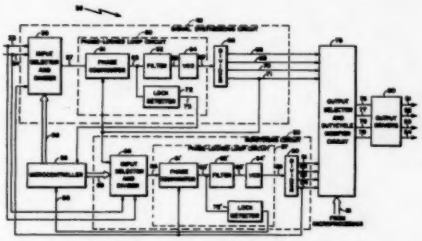
8. A digital loop carrier system coupled between a plurality of subscribers and central office equipment, said digital loop carrier system comprising:

a plurality of line cards, each one of said cards corresponding to at least one of the plurality of subscribers and adapted for being coupled thereto;

a multiplexer/demultiplexer switch coupled to said plurality of line cards;

a plurality of transmission formatting/de-formatting circuits coupled to said multiplexer/demultiplexer switch and adapted for coupling to said central office equipment; and

a control circuit and a timing circuit, each of said control and timing circuits being coupled to said plurality of line cards, said multiplexer/demultiplexer switch, and said plurality of transmission formatting/de-formatting circuits, wherein said timing circuit comprises signal synthesizing means, responsive to an input reference clock signal, for generating a first plurality of frequency synthesized output signals, each one of said first plurality of output signals having a different frequency; and monitoring means including a phase-locked loop circuit, coupled to the signal synthesizing means, for providing at an output of such phase-locked loop circuit, a control signal indicating the deviation of the frequency of the at least one of the plurality of frequency synthesized output signals from a reference frequency.



DESIGN PATENTS

GRANTED Febuary 2, 1993

ERRATA

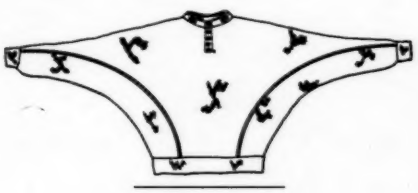
For CLASS	See PATENT NO.
D18- 054	D 332,953

DESIGNS

FEBRUARY 2, 1993

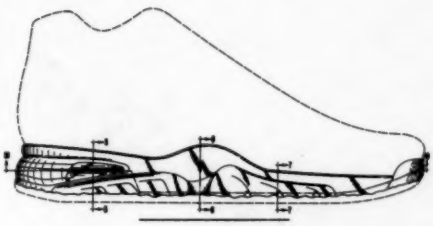
332,858
WARM-UP JACKET
David B. Aubuchon, Festus; Eric Reinsfelder, and Deborah L. Simmons, both of St. Louis, all of Mo., assignors to Figgie International Inc., Willoughby, Ohio
Filed Jan. 23, 1990, Ser. No. 468,952
Term of patent 14 years
U.S. Cl. D2—191

332,859
WARM-UP JACKET
David B. Aubuchon, Festus; Eric Reinsfelder, and Deborah L. Simmons, both of St. Louis, all of Mo., assignors to Figgie International Inc., Willoughby, Ohio
Filed Jan. 23, 1990, Ser. No. 468,961
Term of patent 14 years
U.S. Cl. D2—208

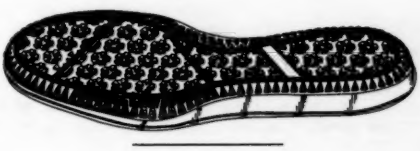


332,860
SHOE UPPER
Charles Legassie, Canton; Judith Ringel, Milton; and Steven F. Smith, Taunton, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass.
Division of Ser. No. 483,435, Mar. 26, 1990, Pat. No. Des. 320,107. This application Jul. 31, 1991, Ser. No. 738,482
Term of patent 14 years
U.S. Cl. D2—314

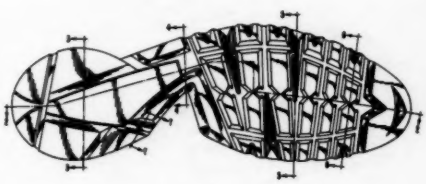
332,861
SHOE MIDSOLE
William J. Worthington, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed May 1, 1992, Ser. No. 877,158
Term of patent 14 years
U.S. Cl. D2—314



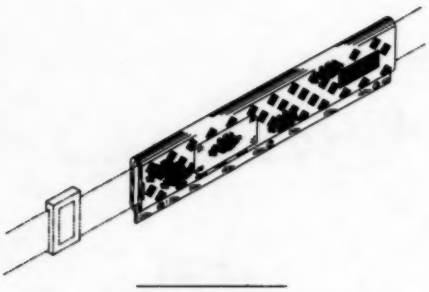
332,862
SHOE SOLE
Junichi Kiyosawa, and Toshikazu Ujishima, both of Kobe, Japan, assignors to Asics Corporation, Hyogo, Japan
Filed Aug. 22, 1991, Ser. No. 748,892
Claims priority, application Japan, Feb. 28, 1991, 2-5514
Term of patent 14 years
U.S. Cl. D2—320



332,863
OUTSOLE
Robert J. Lucas, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Feb. 25, 1992, Ser. No. 840,988
Term of patent 14 years
U.S. Cl. D2—320

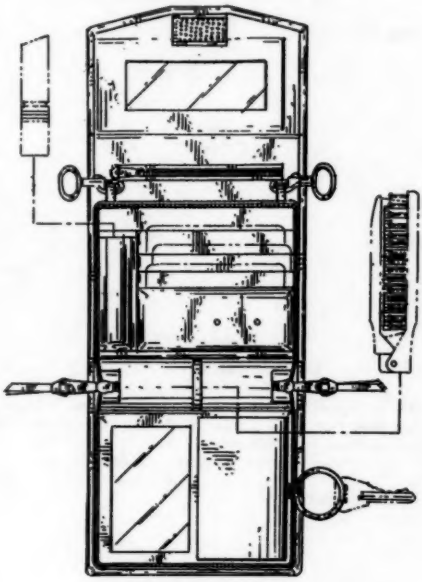


332,864
SEAT BELT COVER
Elizabeth A. Hansen, 175 Bethune Way, Chula Vista, Calif. 92011
Filed Mar. 14, 1991, Ser. No. 669,289
Term of patent 14 years
U.S. Cl. D2—639



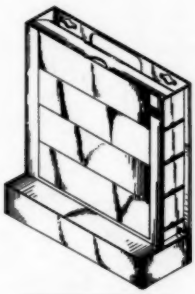
332,865
BABY CARRYING BAG
Margaretha H. M. Wilmink, 117, Biltstraat, NL-3572 AP Utrecht, Netherlands
Continuation-in-part of Ser. No. 25,867, Mar. 16, 1987, abandoned. This application Oct. 16, 1990, Ser. No. 598,215
Claims priority, application Int'l Pat. Institute, Sep. 16, 1986, DM 007/495
Term of patent 14 years
U.S. Cl. D3—31

332,866
COMBINED PURSE AND WALLET
David Kopel, Chatsworth, and John I. Cisowski, West Hills, both of Calif., assignors to Koltov, Inc., Chatsworth, Calif.
Filed May 13, 1991, Ser. No. 699,779
Term of patent 14 years
U.S. Cl. D3—43

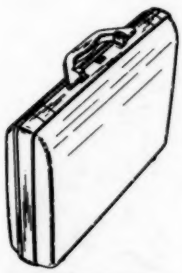


332,867
COMBINED CARRIER AND HOLDER FOR CIRCULAR SAW BLADES
Edward K. Blake, Jr., 17851 Locherbie, Birmingham, Mich. 48009
Filed Nov. 27, 1990, Ser. No. 618,825
Term of patent 14 years
U.S. Cl. D3—73

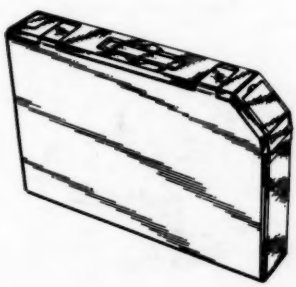
332,868
PORTABLE TOOL CASE
Pi-Chi Chen, No. 1-1, Lane East, Lai Tsuo, Taichung, Taiwan
Filed Apr. 24, 1991, Ser. No. 690,228
Term of patent 14 years
U.S. Cl. D3—74



332,869
ATTACHE CASE
Berndt Diefenbach, Starnberg, Fed. Rep. of Germany, assignor to Carlton International PLC, Enfield, United Kingdom
Filed Jul. 13, 1990, Ser. No. 553,672
Term of patent 14 years
U.S. Cl. D3—76

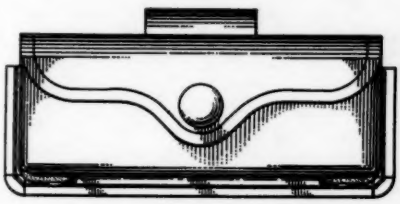


332,870
STORAGE CASE
Cameron L. Fink; Robert W. Schram, and Anthony J. Gentile, all of London, Canada, assignors to Sterling Marking Products Inc-, London, Canada
Filed Jan. 22, 1991, Ser. No. 648,424
Term of patent 14 years
U.S. Cl. D3—76

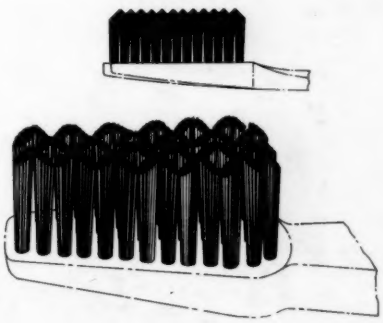


332,871
KNIFE SHEATH
Brett P. Seber, Escondido, Calif., assignor to Buck Knives, Inc., El Cajon, Calif.
Filed Sep. 30, 1991, Ser. No. 767,208
Term of patent 14 years
U.S. Cl. D3—102

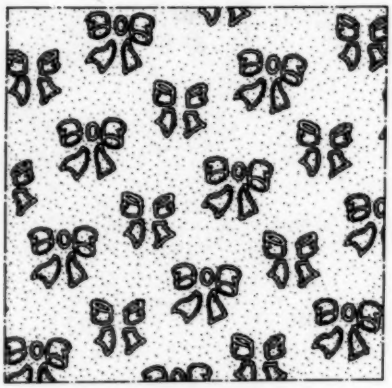
332,872
HORIZONTAL KNIFE SHEATH
Brett P. Seber, Escondido, Calif., assignor to Buck Knives, Inc., El Cajon, Calif.
Filed Sep. 30, 1991, Ser. No. 767,913
Term of patent 14 years
U.S. Cl. D3—102



332,873
SET OF BRISTLES FOR A TOOTHBRUSH
Thomas J. Hall, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Jul. 13, 1990, Ser. No. 553,192
Term of patent 14 years
U.S. Cl. D4—104

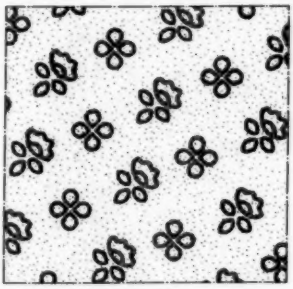


332,874
EMBOSSED TISSUE
Joanne P. Shufelt, Dunwoody; Donna S. Johnston, Roswell, both of Ga., and Tim J. Van Straten, Green Bay, Wis., assignors to Georgia-Pacific Corporation, Atlanta, Ga.
Filed Aug. 6, 1990, Ser. No. 563,342
Term of patent 14 years
U.S. Cl. D5—53

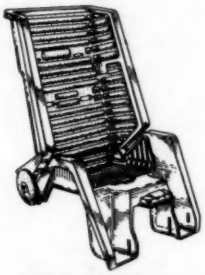


332,875
EMBOSSED TISSUE
Joanne P. Shufelt, Dunwoody; Donna S. Johnston, Roswell, both of Ga., and Tim J. Van Straten, Green Bay, Wis., assignors to Georgia-Pacific Corporation, Atlanta, Ga.
Filed Aug. 6, 1990, Ser. No. 563,343
Term of patent 14 years
U.S. Cl. D5—53

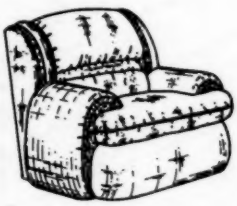
332,876
EMBOSSED TISSUE
Joanne P. Shufelt, Dunwoody, Ga.; Tim J. Van Straten, Green Bay, Wis., and Danna Davis, Alpine, N.J., assignors to Georgia Pacific Corporation, Atlanta, Ga.
Filed Aug. 22, 1990, Ser. No. 572,093
Term of patent 14 years
U.S. Cl. D5—53



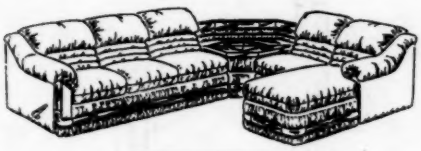
332,877
CHILD'S BICYCLE SEAT
Dixon Newbold, Glocester, R.I., assignor to Bell Sports, Inc., Providence, R.I.
Filed Sep. 29, 1989, Ser. No. 415,189
Term of patent 14 years
U.S. Cl. D6—333



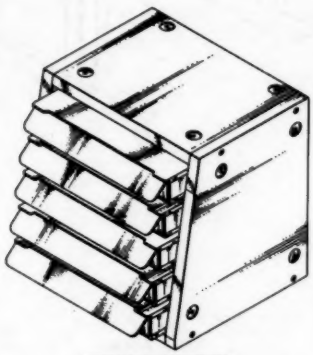
332,878
SEAT
Frank A. Warren, Denville, N.J., assignor to Bushline Corporation, New Tazewell, Tenn.
Filed Dec. 1, 1989, Ser. No. 445,322
Term of patent 14 years
U.S. Cl. D6—334



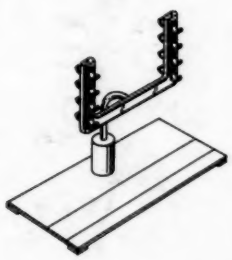
332,879
COMBINED SECTIONAL SOFA AND TABLE UNIT
Robert A. Gera, Glencoe, Ill., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Dec. 7, 1989, Ser. No. 447,246
Term of patent 14 years
U.S. Cl. D6—336



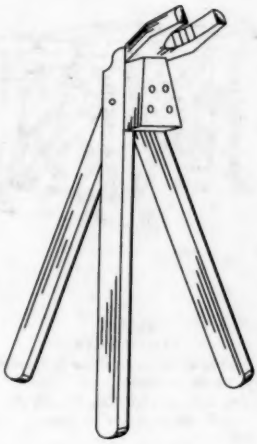
332,880
DISPLAY CABINET
Derwyn Cugley, Brea, and Thomas L. Evans, Laguna Nigel, both of Calif., assignors to VSI Fasteners, Inc., Stanton, Calif.
Filed Jul. 24, 1990, Ser. No. 557,503
Term of patent 14 years
U.S. Cl. D6—446



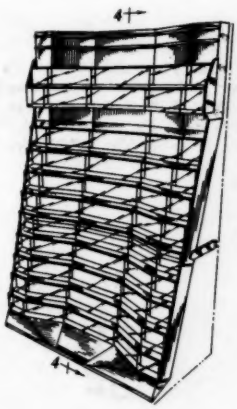
332,881
DISPLAY STAND FOR WRITING INSTRUMENTS
Pamela L. Blackburn, 1953 Victoria Ave., and Tyree E. Sampson, 1951 Victoria Ave., both of Dayton, Ohio 45406
Filed Jan. 12, 1990, Ser. No. 463,985
Term of patent 14 years
U.S. Cl. D6—450



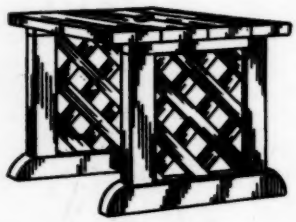
332,882
STRING MUSICAL INSTRUMENT SUPPORT STAND
Jay D. Graves, 4614 Laurel, Bellaire, Tex. 77401
Filed Jun. 4, 1990, Ser. No. 534,661
Term of patent 14 years
U.S. Cl. D6—466



332,883
DISPLAY RACK
Jennis Staude, Gladstone, Mo., assignor to Hallmark Cards, Incorporated, Kansas City, Mo.
Filed Jan. 24, 1990, Ser. No. 470,049
Term of patent 14 years
U.S. Cl. D6—467



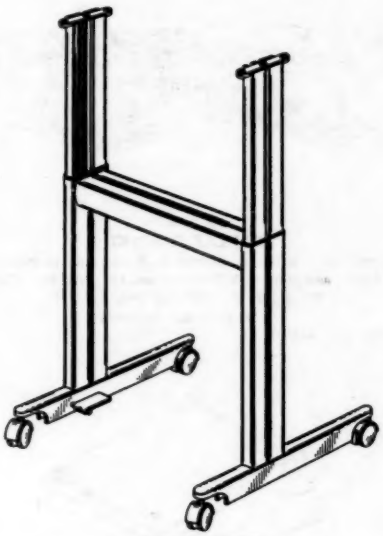
332,884
TABLE
Scott R. Milanowski, 1800 Mapleview, SE., Kentwood, Mich. 49508
Filed Jul. 12, 1990, Ser. No. 552,204
Term of patent 14 years
U.S. Cl. D6—480



332,885
TABLE BASE
Virgil Miller, Archbold, Ohio, assignor to Sauder Manufacturing Company, Archbold, Ohio
Filed Apr. 2, 1990, Ser. No. 503,162
Term of patent 14 years
U.S. Cl. D6—495

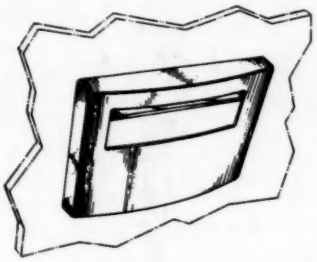
332,886
SUPPORT PEDESTAL FOR A TABLE
Steven A. Beaudry, 12261 Drake St., Coon Rapids, Minn. 55433
Division of Ser. No. 655,233, Feb. 8, 1991, Pat. No. D. 326,201, which is a division of Ser. No. 81,436, Aug. 4, 1987, Pat. No. D. 316,350. This application Mar. 9, 1992, Ser. No. 847,820
Term of patent 14 years
U.S. Cl. D6—495

332,887
MOBILE TABLE BASE
Kim Fjello-Jensen, Svendborg, Denmark, assignor to Fjello-Jensen A/S, Denmark
Filed Sep. 14, 1989, Ser. No. 407,014
Claims priority, application Denmark, Aug. 21, 1989, 1005/89
Term of patent 14 years
U.S. Cl. D6—496

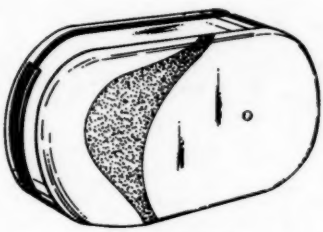


332,888
WINE RACK
David Cook, 203A Kope Rd., Perkiomenville, Pa. 18074
Filed May 1, 1990, Ser. No. 517,059
Term of patent 14 years
U.S. Cl. D6—514

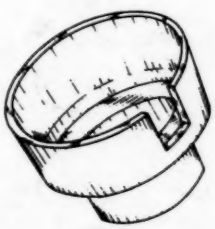
332,889
TOILET SEAT COVER DISPENSER
David M. Hines, Santa Ana, Calif., assignor to Bobrick Washroom Equipment, Inc., North Hollywood, Calif.
Filed Nov. 15, 1991, Ser. No. 792,777
Term of patent 14 years
U.S. Cl. D6—518



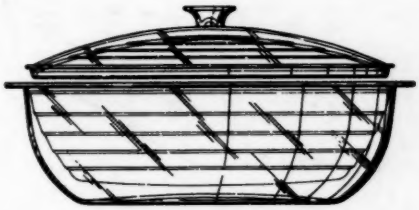
332,890
REMOTELY CONTROLLED CURTAIN POSITIONER COVER
Mark R. Bishai, 2552 Mountain Dr., Upland, Calif. 91786
Filed Nov. 20, 1989, Ser. No. 439,508
Term of patent 14 years
U.S. Cl. D6—580



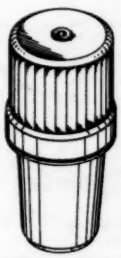
332,891
BEVERAGE CONTAINER ADAPTOR
R. Mack Cumberland, Harbor East, 39-C, Mount Ida, Ark. 71957
Filed Oct. 15, 1990, Ser. No. 597,587
Term of patent 14 years
U.S. Cl. D7—399



332,892
BOWL WITH COVER
Cliff K. Sun, Kwung Tong, Hong Kong, assignor to Kin Hip Metal & Plastic Factory, Ltd., Kwun Tong, Hong Kong
Filed Feb. 6, 1990, Ser. No. 476,019
Claims priority, application United Kingdom, Nov. 30, 1989, 2002032
Term of patent 14 years
U.S. Cl. D7—540

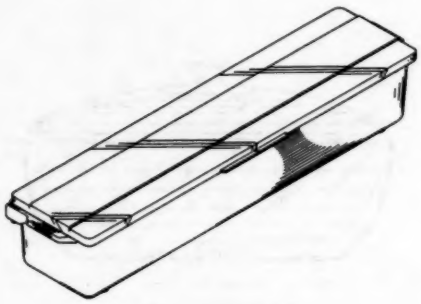


332,893
SPILL PROOF CONTAINER
Keith D. Patternson, Providence, R.I., assignor to Little Kids, Inc., Providence, R.I.
Filed Jun. 18, 1991, Ser. No. 717,103
Term of patent 14 years
U.S. Cl. D7—510

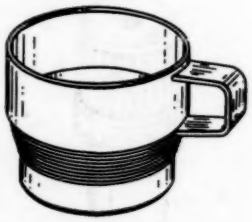


332,894
CUP WITH CLOSURE SPOUT
Richard D. Green, 12979 Culver Blvd., Los Angeles, Calif. 90066
Filed Jul. 29, 1991, Ser. No. 736,828
Term of patent 14 years
U.S. Cl. D7—511

332,895
BAR CONDIMENT TRAY
Ferdinand F. Salzmann, Prairie du Sac, Wis., assignor to Traex Corporation, Dane, Wis.
Filed Jul. 3, 1990, Ser. No. 547,907
Term of patent 14 years
U.S. Cl. D7—590

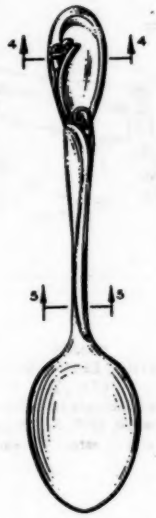


332,896
CUP-HOLDER
Siegfried Hoelterscheidt, Hückelhoven, Fed. Rep. of Germany, assignor to Walter Henkels GmbH, Fed. Rep. of Germany
Filed Mar. 6, 1991, Ser. No. 665,179
Term of patent 14 years
U.S. Cl. D7—622

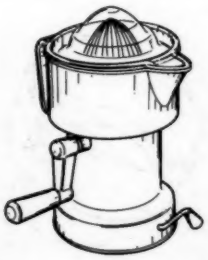


332,897
COMBINED CONTAINER WITH LID
Anne C. Bucher, Rolling Meadows, and Marcia Baxter, Chicago, both of Ill., assignors to Kraft General Foods, Inc., Northfield, Ill.
Filed Jun. 19, 1991, Ser. No. 717,718
Term of patent 14 years
U.S. Cl. D7—629

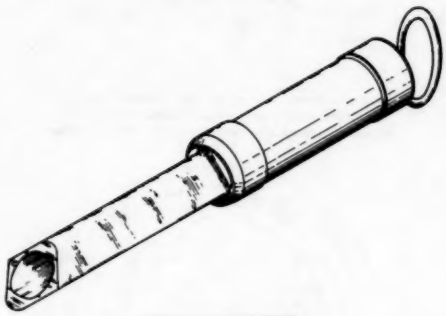
332,898
SPOON
Paul E. Gebhardt, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Apr. 2, 1990, Ser. No. 504,262
Term of patent 14 years
U.S. Cl. D7—660



332,899
JUICER
So Shun, Kowloon, Hong Kong, assignor to Ki Mee Metal & Plastic Factory Limited, Hong Kong
Filed Dec. 28, 1990, Ser. No. 635,781
Claims priority, application United Kingdom, Jul. 16, 1990, 2008324
Term of patent 14 years
U.S. Cl. D7—666

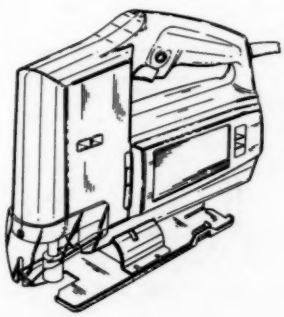


332,900
FOOD STUFFING KNIFE
John G. Aquilina, 1004 Hamilton Road, McDowell, Queensland, 4053, Australia
Filed Oct. 11, 1990, Ser. No. 595,924
Claims priority, application Australia, Apr. 11, 1990, 1089/90
Term of patent 14 years
U.S. Cl. D7—669



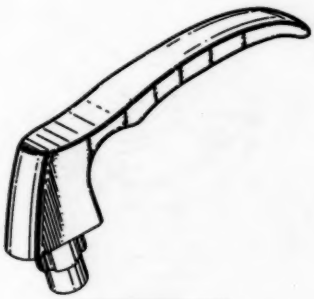
332,901
CAULKING TOOL
Carl E. Campbell, Morrison, Colo., assignor to Christian Brothers, Inc., Morrison, Colo.
Filed Aug. 30, 1990, Ser. No. 574,938
Term of patent 14 years
U.S. Cl. D8—45

332,902
SABRE SAW
Richard E. Dobson, Easley, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.
Filed Jul. 30, 1990, Ser. No. 559,885
Term of patent 14 years
U.S. Cl. D8—64

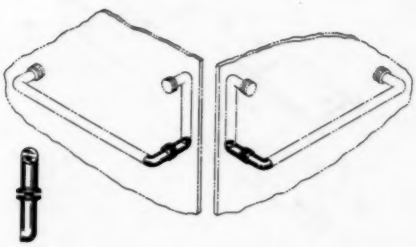


332,903
HANDLE FOR A FIREPLACE TOOL
John S. Adams, 1566 Rockdale Rd., Dubuque, Iowa 52001
Filed Sep. 14, 1990, Ser. No. 582,539
Term of patent 14 years
U.S. Cl. D8—107

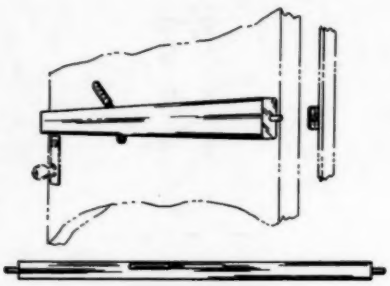
332,904
HANDLE
David D. Plummer, Hudson, Wis., and Randy A. Davis, Minneapolis, Minn., assignors to Andersen Corporation, Bayport, Minn.
Filed Mar. 18, 1991, Ser. No. 671,290
Term of patent 14 years
U.S. Cl. D8—308



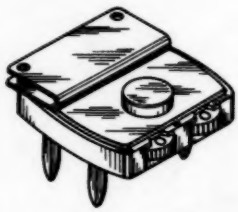
332,905
SUPPORT FOR A HANDLE UNIT
Todd D. Dannenberg, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jun. 22, 1990, Ser. No. 542,601
Term of patent 14 years
U.S. Cl. D8—321



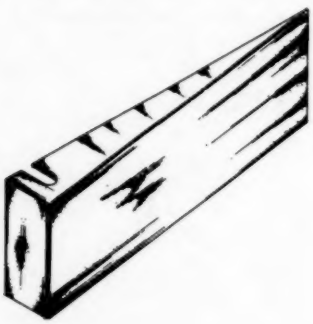
332,906
SECURITY LATCH
Gary L. Hall, 11 Hickory Hills Clr., and Denis A. Hall, 4021 Longview, both of Little Rock, Ark. 72212
Filed Jan. 25, 1990, Ser. No. 469,844
Term of patent 14 years
U.S. Cl. D8—331



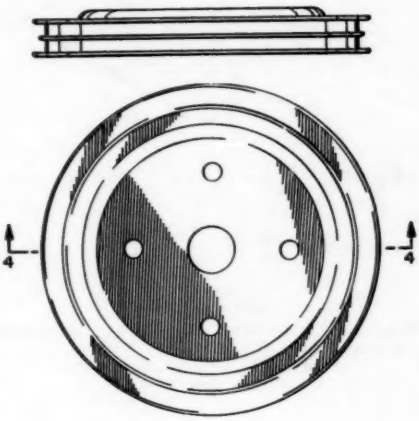
332,907
LUGGAGE LOCK
Urs Gisiger, Schulhausstrasse 19, 2545 Selzach, Switzerland
Filed Aug. 2, 1990, Ser. No. 562,943
The portion of the term of this patent subsequent to Jul. 7, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—331



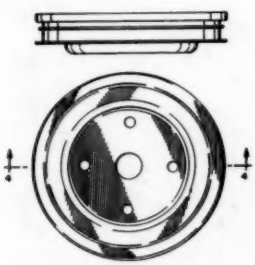
332,908
DOOR BOLT SHROUD
Terrance J. Olsen, 5590 Calle Vista Linda, Yorba Linda, Calif. 92670
Filed Jul. 2, 1990, Ser. No. 550,703
Term of patent 14 years
U.S. Cl. D8—346



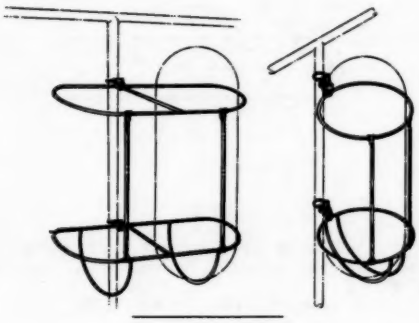
332,909
PULLEY
Toshiaki Kanemitsu, Kobe; Kazuyuki Oda, Hyogo, and Shuji Kanemitsu, Kobe, all of Japan, assignors to Kabushiki Kaisha Kanemitsu, Japan
Filed May 29, 1991, Ser. No. 706,731
Claims priority, application Japan, Dec. 12, 1990, DES 2-41688; Dec. 12, 1990, DES 2-41690; Dec. 12, 1990, DES 2-41698; Dec. 19, 1990, DES 2-42512
Term of patent 14 years
U.S. Cl. D8—360



332,910
PULLEY
Toshiaki Kanemitsu, Kobe, and Kazuyuki Oda, Hyogo, both of Japan, assignors to Kabushiki Kaisha Kanemitsu, Japan
Filed May 29, 1991, Ser. No. 706,733
Claims priority, application Japan, Dec. 12, 1990, Des. 2-41691; Dec. 12, 1990, Des. 2-41692
Term of patent 14 years
U.S. Cl. D8—360



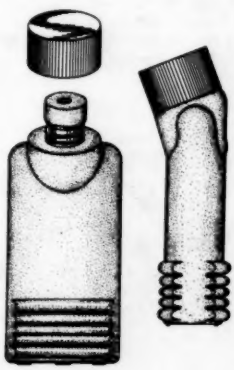
332,911
FENDER HOLDER
Robert G. Barbour, and Glenn A. Smith, both of Los Angeles, Calif., assignors to Windline Marine, Los Angeles, Calif.
Filed Mar. 6, 1990, Ser. No. 489,594
Term of patent 14 years
U.S. Cl. D8—373



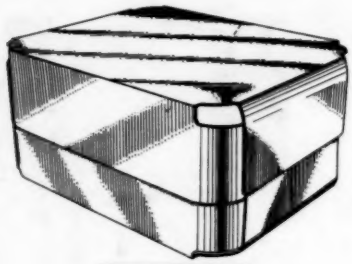
332,912
BOTTLE
Nicola Trussardi, Milano, Italy, assignor to Trussardi S.p.A., Milano, Italy
Filed Jan. 14, 1991, Ser. No. 641,117
Claims priority, application World Int. Prop. O., Jul. 31, 1990, DMA/001297
Term of patent 14 years
U.S. Cl. D9—300

332,913
COMBINED BOTTLE AND PUMP DISPENSER
Lisa Carroll, New York, N.Y., assignor to L'Oreal S.A., Paris, France
Filed May 17, 1991, Ser. No. 701,984
Term of patent 14 years
U.S. Cl. D9—300

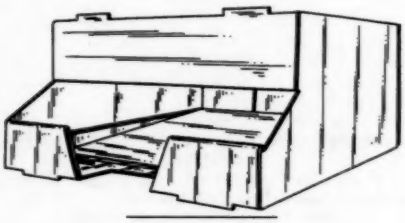
332,914
COMBINED CONTAINER AND APPLICATOR FOR LIQUIDS
Brian Stephens, Dun Laoghaire, Ireland, assignor to Glanmire Industries Limited, Little Island, Ireland
Filed Jun. 27, 1990, Ser. No. 544,853
Claims priority, application Ireland, Feb. 26, 1990, D70/90
Term of patent 14 years
U.S. Cl. D9—338



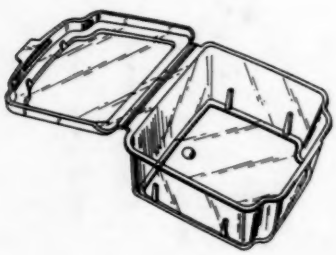
332,915
CAN CARTON
Norbert Hoell, Southgate, Ky., and Charles A. Miller, Williamsburg, Ohio, assignors to The C. W. Zumbiel Co., Cincinnati, Ohio
Filed Sep. 4, 1991, Ser. No. 754,690
Term of patent 14 years
U.S. Cl. D9—346



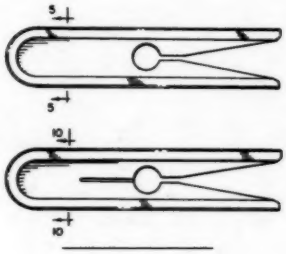
332,916
COMBINED PACKAGE AND DISPENSING DISPLAY UNIT FOR CANDY
Ingvar Bärnskog, Mantorp, Sweden, assignor to AB Cloetta, Sweden
Filed Jul. 10, 1990, Ser. No. 550,727
Claims priority, application Sweden, Mar. 9, 1990, 90-569
Term of patent 14 years
U.S. Cl. D9—417



332,917
CONTAINER
John F. McDevitt, Evanston; David J. Johnson, Beach Park, and Denis H. Nelson, Wheaton, all of Ill., assignors to Kraft General Foods, Inc., Northfield, Ill.
Filed Jul. 11, 1991, Ser. No. 728,937
Term of patent 14 years
U.S. Cl. D9—423



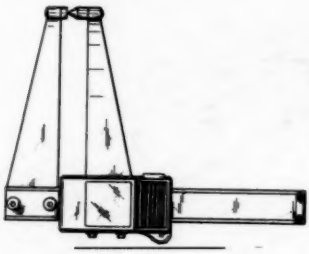
332,918
BAG CARRYING HANDLE
Leslie H. Fleming, La Rambla Shopping Center, Ponce, P.R. 00731
Filed Apr. 4, 1991, Ser. No. 680,283
Term of patent 14 years
U.S. Cl. D9—434



332,919
JAR
Lisa Turnbull, Scotch Plains, N.J., and Dale G. DeVore, Elmore, Ohio, assignors to CPC International Inc., Englewood Cliffs, N.J.
Filed Oct. 7, 1991, Ser. No. 773,399
Term of patent 14 years
U.S. Cl. D9—500

332,920
BOTTLE
Paolo Tiramani, Greenwich, Conn., and Thomas Van Dyk, Prospect Park, N.J., assignors to Goody Products, Inc., Kearney, N.J.
Filed Feb. 12, 1991, Ser. No. 646,989
Term of patent 14 years
U.S. Cl. D9—552

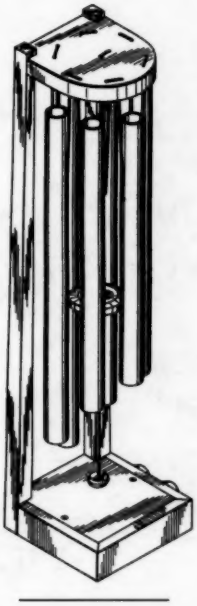
332,921
DIGITAL CALIPER
Richard L. Victor, Sr., Mendon, Mass., assignor to Central Tools, Inc., Cranston, R.I.
Filed Sep. 16, 1991, Ser. No. 760,250
Term of patent 14 years
U.S. Cl. D10—73



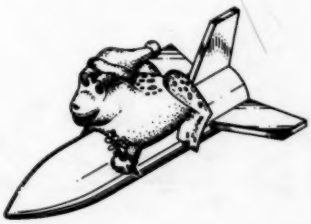
332,922
FISHING WEIGH SCALE
Richard J. Robbins, Derby, Kans., assignor to Zebco Corporation, Tulsa, Okla.
Filed Jan. 24, 1990, Ser. No. 470,034
Term of patent 14 years
U.S. Cl. D10—89

332,923
ENGINE OPERATING TIME HOUR METER
Nicholas G. Polydoris, Wilmette; Paul Mitchell, Glenview; Stanislaw Kocol; James George, both of Chicago, and Stan Mazulis, Wildwood, all of Ill., assignors to ENM Company, Chicago, Ill.
Filed May 25, 1990, Ser. No. 529,175
Term of patent 14 years
U.S. Cl. D10—100

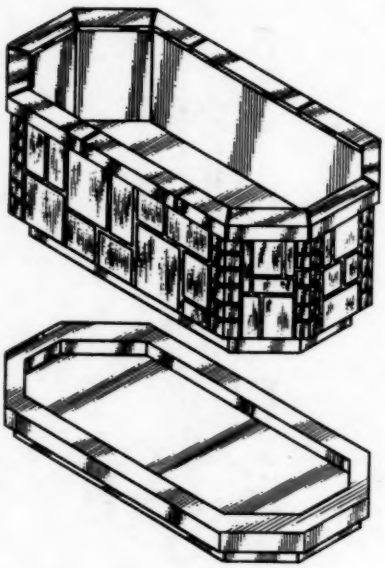
332,924
INDOOR CHIMES
Stan Schutze, 6864 Richard St., San Diego, Calif. 92115
Filed Apr. 22, 1991, Ser. No. 688,357
Term of patent 14 years
U.S. Cl. D10—118



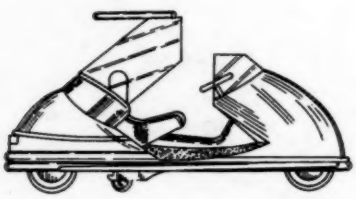
332,925
CHRISTMAS ORNAMENT
Brian Kucheran, 301 - 6350 Willingdon Avenue, Burnaby, British Columbia, Canada V5H 2V4 , and Mark Lash, 204 Wood Street, New Westminster, British Columbia, Canada V3M 5K4
Filed Apr. 3, 1991, Ser. No. 679,590
Term of patent 14 years
U.S. Cl. D11—125



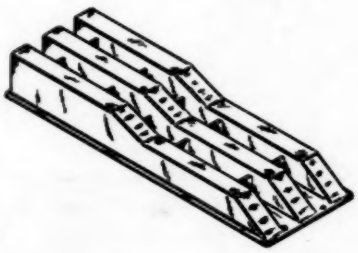
332,926
LANDSCAPE FLOWER PLANTER
Nathan B. Grant, 54 Cramer Rd., Poughkeepsie, N.Y. 12603
Filed Mar. 18, 1991, Ser. No. 670,617
Term of patent 14 years
U.S. Cl. D11—149



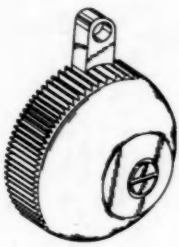
332,927
MOTOR VEHICLE
Ferdinand H. Ferino, 736 Robinson Ave., San Diego, Calif. 92103
Filed Oct. 23, 1990, Ser. No. 601,581
Term of patent 14 years
U.S. Cl. D12—1



332,928
RECREATIONAL VEHICLE TRAILER LEVELER
Charles C. Gilbert, 1314 Auburn Dr., and Howard J. Humphries, 2481 San Carlos Cir., both of Colorado Springs, Colo. 80909
Filed May 14, 1991, Ser. No. 699,564
Term of patent 14 years
U.S. Cl. D12—106

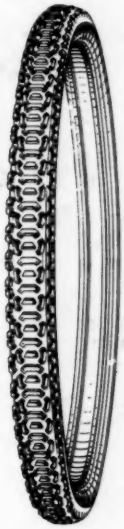


332,929
KEY FOR BICYCLE HANDLEBAR LOCK
Laroy J. Van Dyke, Audubon, Pa., assignor to Innovative Bicycle Products, Inc., Huntingdon Valley, Pa.
Filed Feb. 22, 1991, Ser. No. 659,128
Term of patent 14 years
U.S. Cl. D12—117



332,930
PATIENT TRANSFER STRETCHER
Scott W. Clark, 2771 Delaney Ct., Palm Harbor, Fla. 34684, and David D. Watson, 4650 S. Eiden Pt., Inverness, Fla. 32650
Filed Apr. 9, 1991, Ser. No. 682,219
Term of patent 14 years
U.S. Cl. D12—128

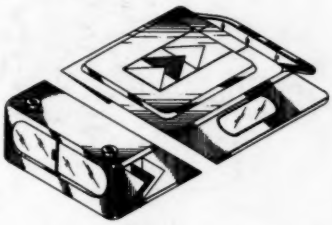
332,931
BICYCLE TIRE
Rio Marui, Higahinada, Japan, assignor to Marui Ltd., Kobe, Japan
Filed Mar. 19, 1990, Ser. No. 495,299
Term of patent 14 years
U.S. Cl. D12—136



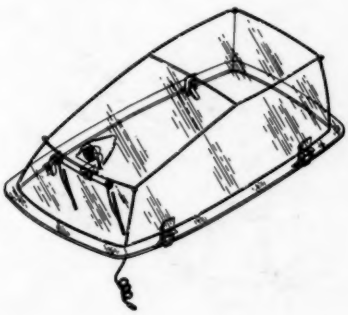
332,932
REMOVABLE BOARDING HANDLE FOR BOATS
Richard A. Nichols, 617 Mathews Road, Port Robinson, Ontario, Canada L0S 1K0 , and John R. Jell, 966 Inverhouse Drive, Suite 1506, Mississauga, Ontario, Canada L5J 4B6
Filed Jan. 14, 1991, Ser. No. 641,088
Term of patent 14 years
U.S. Cl. D12—317

332,933
AUTOMOBILE TIRE
Toru Tsuda, and Yasuhiro Hamada, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Sep. 5, 1990, Ser. No. 578,104
Claims priority, application Japan, Mar. 5, 1990, 2-6923
Term of patent 14 years
U.S. Cl. D12—147

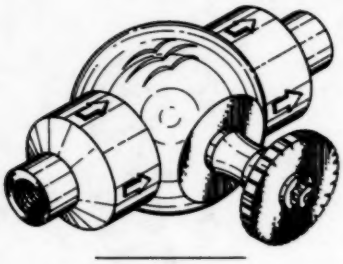
332,934
COMBINED TRUCK MOUNTED SPOILER AND CAMPER SHELL
Michael Brown, and Karen Brown, both of 2574 Buenger Blvd., Granite City, Ill. 62040
Filed Mar. 27, 1991, Ser. No. 675,703
Term of patent 14 years
U.S. Cl. D12—156



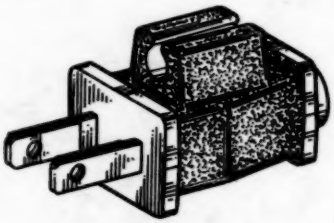
332,935
COVER FOR BOAT PASSENGER AREA
Laverne Moore, P.O. Box 184, Lumberbridge, N.C. 28357
Filed Oct. 4, 1990, Ser. No. 592,868
Term of patent 14 years
U.S. Cl. D12—317



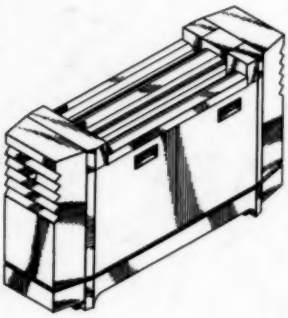
332,936
FLUID POWER ELECTRICITY GENERATOR
David Lawrence, P.O. Box 74, Modoc, S.C. 29838
Filed Apr. 20, 1990, Ser. No. 511,532
Term of patent 14 years
U.S. Cl. D13—112



332,937
MOLDED PLUG
James D. Priest, New Paris, Ohio, and Shakil U. Qureshi, Richmond, Tex., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Jan. 29, 1990, Ser. No. 471,984
Term of patent 14 years
U.S. Cl. D13—138

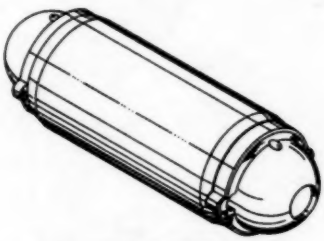


332,938
ELECTRICAL CONNECTOR HOUSING
Lahman D. Lambert, II, Carlisle, Pa., and Dean A. Puerner, Maricopa, Ariz., assignors to AMP Incorporated, Harrisburg, Pa.
Continuation-in-part of Ser. No. 494,053, Mar. 15, 1990, Pat. No. 4,791,571. This application Nov. 8, 1990, Ser. No. 610,592
Term of patent 14 years
U.S. Cl. D13—133



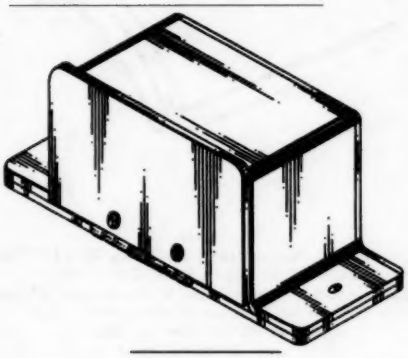
332,939
WELDABLE GROUNDING CLAMP
Robert M. McDonough, Jr., 105 S. Charlene Dr., Panama City, Fla. 32404
Filed Aug. 15, 1990, Ser. No. 567,548
Term of patent 14 years
U.S. Cl. D13—149

332,940
HOLDER FOR SECURING CONNECTION OF ELECTRICAL EXTENTION CORDS
Robert L. Finlay, Emporia, Kans., assignor to BPE, Inc., Emporia, Kans.
Filed Jul. 2, 1990, Ser. No. 547,098
Term of patent 14 years
U.S. Cl. D13—154



332,941
HOLLOW COVING FOR CONCEALING ELECTRICAL WIRES
Steve E. Kaplan, Elyria, Ohio, assignor to Multilink, Inc., Elyria, Ohio
Filed Jan. 10, 1991, Ser. No. 641,118
Term of patent 14 years
U.S. Cl. D13—155

332,942
VEHICLE TRAILER ELECTRICAL CONNECTOR STORAGE BOX
Wayne S. Julien, Orlando, Fla., assignor to J & W Products, Inc., Orlando, Fla.
Filed Aug. 27, 1990, Ser. No. 572,794
Term of patent 14 years
U.S. Cl. D13—184

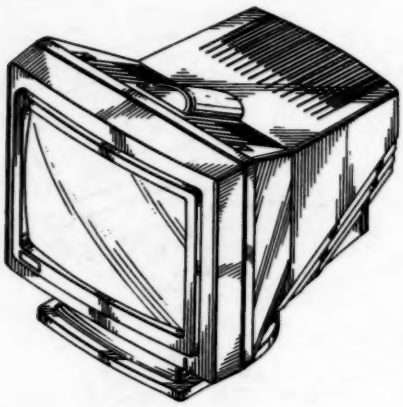


332,943
IC CARD INPUT AND OUTPUT TERMINAL
Norimi Koiwa, and Shigemi Sato, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd. and NTT Data Communications Systems Corporation, both of Tokyo, Japan
Filed May 18, 1990, Ser. No. 525,023
Claims priority, application Japan, Feb. 22, 1990, 2-5369
Term of patent 14 years
U.S. Cl. D14—105

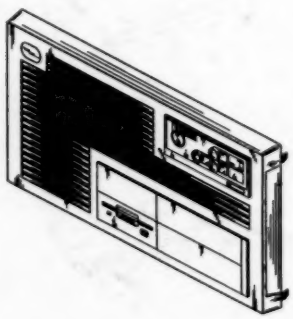
332,944
LAP TOP COMPUTER
Gyu C. Kim, Yongin-gun, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi-Do, Rep. of Korea
Filed Jul. 19, 1990, Ser. No. 554,846
Claims priority, application Rep. of Korea, Apr. 25, 1990, 90-5621
Term of patent 14 years
U.S. Cl. D14—106

332,945
PORTABLE DATA TERMINAL
Dino M. Savio, Clearwater, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 22, 1991, Ser. No. 703,994
Term of patent 14 years
U.S. Cl. D14—106

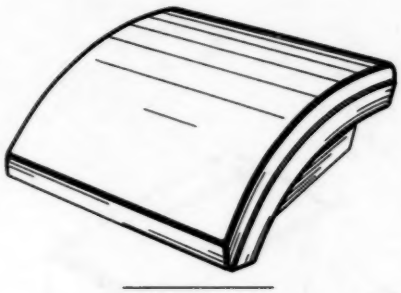
332,946
COMPUTER MONITOR
George Kao, Taipei, Taiwan, assignor to Peripheral Technology, Inc., Taipei, Taiwan
Filed Dec. 10, 1990, Ser. No. 624,775
Claims priority, application Taiwan, Nov. 9, 1990, 79307377
Term of patent 14 years
U.S. Cl. D14—113



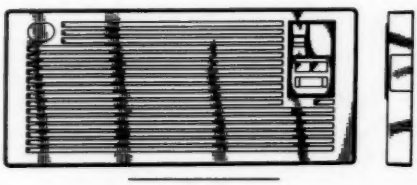
332,947
FRONT PANEL FOR A DATA PROCESSING SYSTEM
Jeffrey L. Kline; Tristan A. Merino; Billy D. Purcell, all of Austin, and Edward J. Sabella, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 13, 1990, Ser. No. 480,180
Term of patent 14 years
U.S. Cl. D14—115



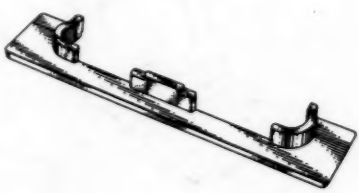
332,948
HOUSING FOR A KEYBOARD
Lance Barr, Redmond, Wash., assignor to Nintendo of America Inc., Redmond, Wash.
Filed Dec. 27, 1989, Ser. No. 501,831
Term of patent 14 years
U.S. Cl. D14—115



332,949
FRONT PANEL FOR A DIRECT ACCESS STORAGE UNIT FOR A DATA PROCESSING SYSTEM
Wayne L. Aderman, Zumbro Falls, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 28, 1990, Ser. No. 546,057
Term of patent 14 years
U.S. Cl. D14—115

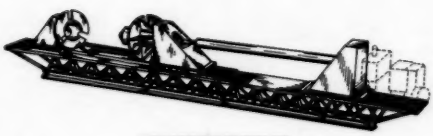


332,950
SNAP GUIDE
Bruce L. Kirwan, Concord, and Thomas W. Petrie, Oakland, both of Calif., assignors to Thunderware, Inc., Orinda, Calif.
Filed Nov. 5, 1990, Ser. No. 608,891
Term of patent 14 years
U.S. Cl. D14—116

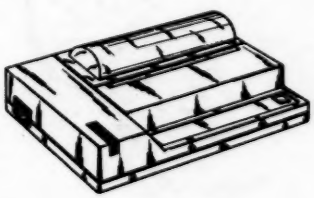


332,951
ENGINE ACCESSORY MOUNTING BRACKET
William R. Seats, 656 E. Cypress, Covina, Calif. 91723
Filed Dec. 14, 1990, Ser. No. 627,378
Term of patent 14 years
U.S. Cl. D15—5

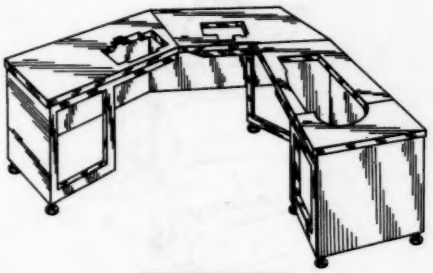
332,952
MACHINE FOR BUNDLING TIRES
Ricky J. Hoke, Box 324A Humaston Rd., Rome, N.Y. 13440
Filed May 18, 1990, Ser. No. 524,832
Term of patent 14 years
U.S. Cl. D15—9



332,953
PRINTER
Christian Sturtzer, Axena, France, assignor to Sinfa, Herblay, France
Filed Nov. 15, 1990, Ser. No. 613,258
Claims priority, application France, May 16, 1990, 903150
Term of patent 14 years
U.S. Cl. D18—54

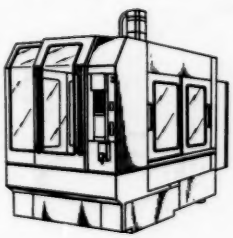


332,954
WORK STATION TO STITCH MANUFACTURED ITEMS
Roberto Sanvito, Milan, Italy, assignor to Rimoldi, S.R.L., Italy
Continuation-in-part of Ser. No. 218,929, Jul. 13, 1988, abandoned. This application Dec. 29, 1990, Ser. No. 633,423
Claims priority, application Italy, May 30, 1988, 21322 B/88
Term of patent 14 years
U.S. Cl. D15—66

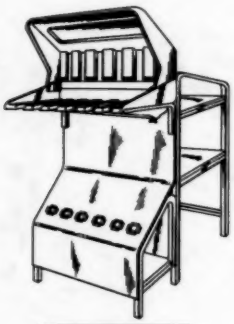


332,955
PIVOTAL CHUTE
Herman E. Hull, 7163 County Rd. 135, Kenton, Ohio 43326
Filed Jan. 11, 1990, Ser. No. 463,603
Term of patent 14 years
U.S. Cl. D15—122

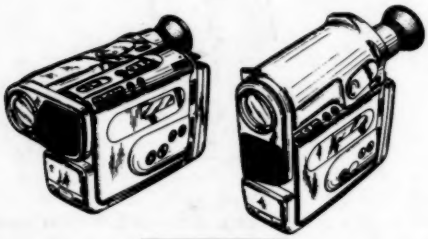
332,956
NUMERICALLY CONTROLLED DRILLING MACHINE
Nobuyuki Suda, Oshino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan
Filed Feb. 26, 1991, Ser. No. 661,087
Claims priority, application Japan, Oct. 5, 1990, 2-33426
Term of patent 14 years
U.S. Cl. D15—132



332,957
LUBRICATION WORK STATION
Gary W. Kling; Jerry D. Shew, both of Charlotte, N.C., and Theodore W. Beise, Arlington Heights, Ill., assignors to Stewart Warner Alemite Corporation, Charlotte, N.C.
Filed Nov. 1, 1990, Ser. No. 608,183
Term of patent 14 years
U.S. Cl. D15—151

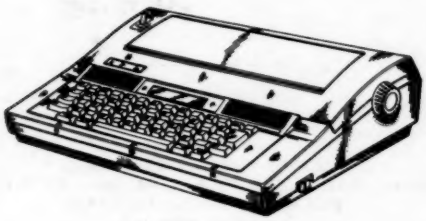


332,958
COMBINED VIDEO TAPE RECORDER AND CAMERA
Atsuhiko Urushihara, Kokubunji; Atsutoshi Sato, Koganei; Hiroto Takita, Higashi Kurume; Takanori Nishiyama, Koganei; Akira Takahashi, Saitama, and Masami Mizuno, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 25, 1991, Ser. No. 674,054
Claims priority, application Japan, Sep. 25, 1990, 2-31765
Term of patent 14 years
U.S. Cl. D16—202



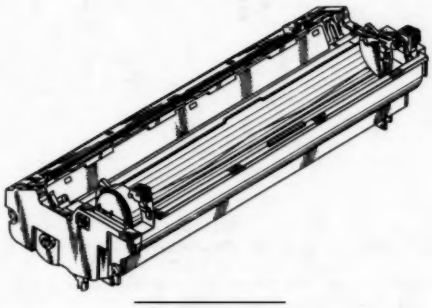
332,959
HARMONICA HOLDER
Thomas M. Ileo, 94 Whitehall St., Providence, R.I. 02909
Filed Jun. 25, 1990, Ser. No. 543,298
Term of patent 14 years
U.S. Cl. D17—13

332,960
TYPEWRITER
Paul M. Pierce, Syracuse, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Aug. 20, 1990, Ser. No. 570,175
The portion of the term of this patent subsequent to Nov. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—1



332,961
CALCULATOR
Richard Peersmann, Scheveningen, Netherlands, assignor to Pollyflame International B.V., Netherlands
Filed Mar. 8, 1990, Ser. No. 490,269
Claims priority, application Hague, Dec. 11, 1989, DM/015317
Term of patent 14 years
U.S. Cl. D18—7

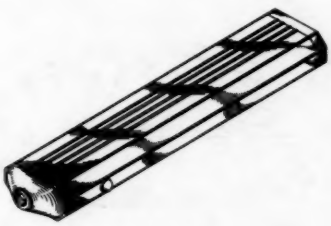
332,962
IMAGE DRUM CARTRIDGE
Hiroshi Kikuchi; Hisao Ono; Yoshiharu Momiyama, and Shigeki Nakajima, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Dec. 28, 1989, Ser. No. 458,381
Claims priority, application Japan, Nov. 2, 1989, 1-39926
Term of patent 14 years
U.S. Cl. D18—43



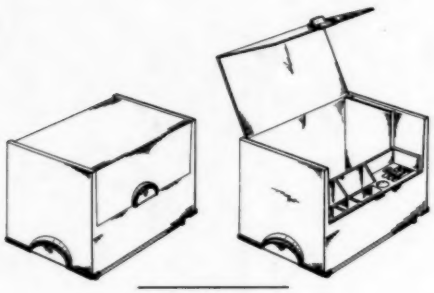
332,963
WRITING INSTRUMENT
Por Anavil, and Julian M. H. Deeley, both of Bangkok, Thailand, assignors to D.T.C. Industries Limited, Thailand
Filed Jan. 19, 1989, Ser. No. 300,053
Term of patent 14 years
U.S. Cl. D19—49

332,964
MARKING INSTRUMENT
Giorgetto Giugiaro, Turin, Italy, assignor to The Gillette Company, Boston, Mass.
Filed Mar. 15, 1991, Ser. No. 670,214
Claims priority, application Argentina, Sep. 17, 1990, 056877
Term of patent 14 years
U.S. Cl. D19—49

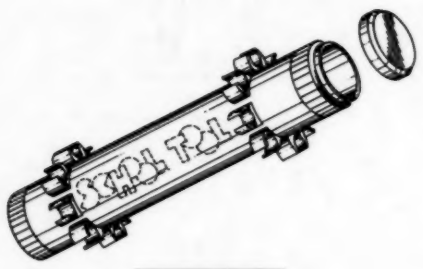
332,965
LASER POINTER
Tzyh-Sheng Wu, and Jair-Horng Lian, both of Taipei, Taiwan, assignors to Pacific Electric Wire & Cable Co., Ltd., Taipei, Taiwan
Filed Aug. 28, 1990, Ser. No. 574,239
Term of patent 14 years
U.S. Cl. D19—59



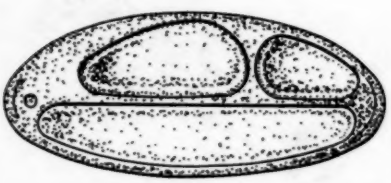
332,966
COMBINED FILE BOX AND ORGANIZER FOR ASSORTED DESK ARTICLES
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jul. 16, 1991, Ser. No. 729,088
Term of patent 14 years
U.S. Cl. D19—75



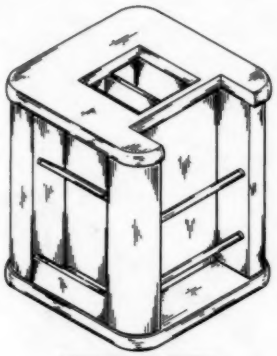
332,967
SCHOOL SUPPLY HOLDER
Buck Oglesby, P.O. Box 464, Lyons, Ga. 30436
Filed Feb. 14, 1990, Ser. No. 479,749
Term of patent 14 years
U.S. Cl. D19—77



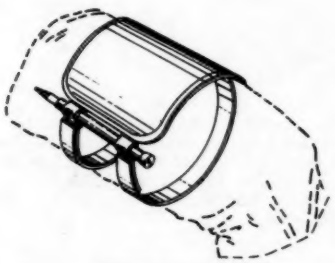
332,968
HOLDER FOR ASSORTED DESK ARTICLES
Richard F. M. Peersmann, Scheveningen, Netherlands, assignor to Pollyflame International B.V., Roelofarendsveen, Netherlands
Filed Jul. 3, 1991, Ser. No. 725,743
Claims priority, application United Kingdom, Jan. 8, 1991, 2012178
Term of patent 14 years
U.S. Cl. D19—77



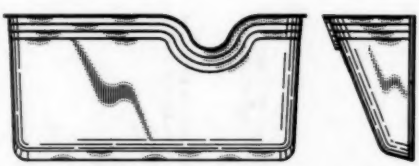
332,969
OFFICE GADGET ORGANIZER
Bruce Ancona, and Jane Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.
Filed Jul. 29, 1991, Ser. No. 735,121
Term of patent 14 years
U.S. Cl. D19—77



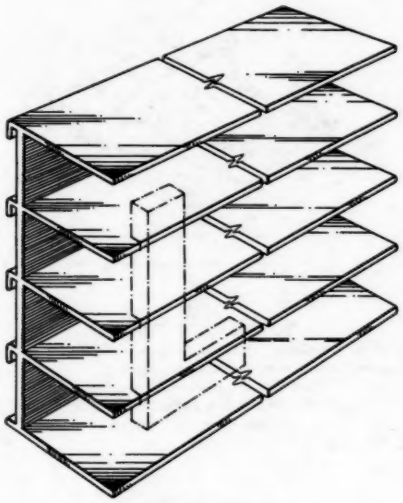
332,970
COMBINED THIGH-MOUNTABLE WRITING SURFACE AND WRITING INSTRUMENT
Chad A. Myers, Fort Collins, Colo., assignor to Monty Fritts and Darren Myers, Ottawa, Kans.
Filed Jun. 24, 1991, Ser. No. 719,526
Term of patent 14 years
U.S. Cl. D19—78



332,971
VERTICALLY-MOUNTABLE FILE ASSEMBLY MODULE
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jun. 13, 1991, Ser. No. 714,747
Term of patent 14 years
U.S. Cl. D19—90

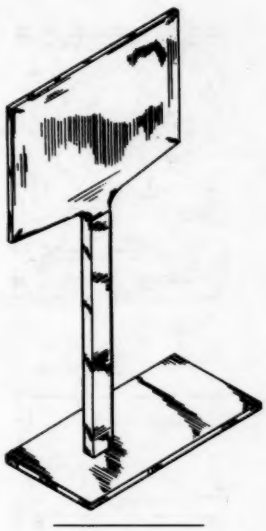


332,972
GRAPHICS DISPLAY SUPPORT STAND
Richard G. Lott, 4238 Dumfries Street, Vancouver, British Columbia, Canada V5N 3T2
Filed May 7, 1990, Ser. No. 520,227
Claims priority, application Canada, Nov. 7, 1989, 0711895
Term of patent 14 years
U.S. Cl. D20—10

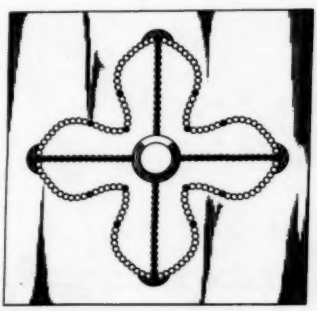


332,973
SIGN
James M. Jenkins, and Jerry D. Jenkins, both of Rte. 2, Box 214-B, Ellerbe, N.C. 28338
Filed Mar. 18, 1991, Ser. No. 670,616
Term of patent 14 years
U.S. Cl. D20—10

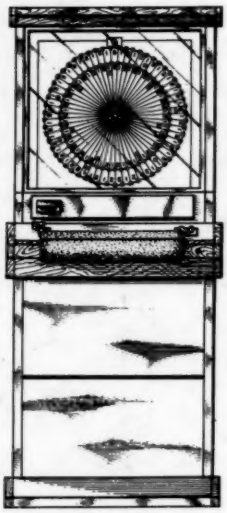
332,974
ADVERTISING SIGNBOARD
Réjean Asselin, Laval, Canada, assignor to Re/Max Quebec Inc., Laval, Canada
Filed Jan. 31, 1991, Ser. No. 648,380
Term of patent 14 years
U.S. Cl. D20—41



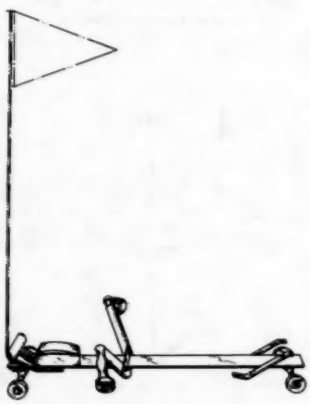
332,975
GAME BOARD
Fernando N. Terminel, P.O. Box 16799, South Lake Tahoe, Calif. 95702
Filed Nov. 26, 1990, Ser. No. 617,862
Term of patent 14 years
U.S. Cl. D21—35



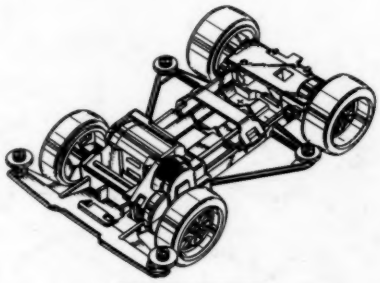
332,976
SLOT MACHINE
Leroy H. Gutknecht, 735 Oakmount #408, and Michael A. Wichinsky, 2575 S. Highland Dr., both of Las Vegas, Nev. 89109
Filed Mar. 23, 1990, Ser. No. 497,644
Term of patent 14 years
U.S. Cl. D21—39



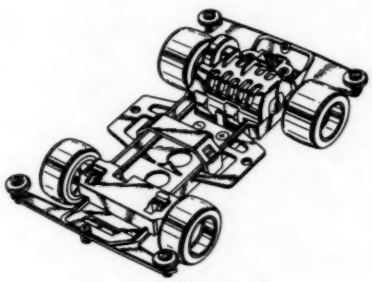
332,977
STUNT RIDING TOY
Michael L. Huffman, and Michael D. Commerford, both of Festus, Mo., assignors to High Tech Toys, Inc., Festus, Mo.
Filed May 20, 1991, Ser. No. 702,711
Term of patent 14 years
U.S. Cl. D21—71



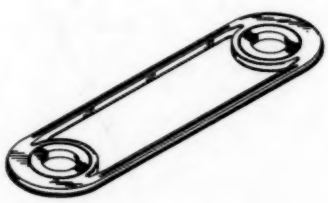
332,978
TOY VEHICLE CHASSIS
Hirotsugu Tsuchiya, Shizuoka, Japan, assignor to Kabushiki Kaisha Tamiya Mokei, Shizuoka, Japan
Filed Feb. 20, 1991, Ser. No. 658,364
Claims priority, application Japan, Dec. 28, 1990, 2-43766
Term of patent 14 years
U.S. Cl. D21—141



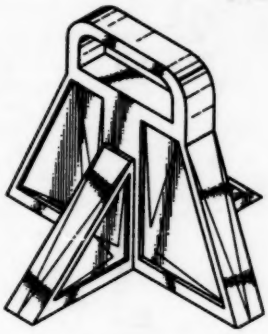
332,979
TOY VEHICLE CHASSIS
Hirotsugu Tsuchiya, Shizuoka, Japan, assignor to Kabushiki Kaisha Tamiya Mokei, Shizuoka, Japan
Filed Feb. 20, 1991, Ser. No. 658,366
Claims priority, application Japan, Dec. 28, 1990, 2-43767
Term of patent 14 years
U.S. Cl. D21—147



332,980
RESISTANCE STRAP FOR AN EXERCISE MACHINE
Jerry L. Wilson; Jon R. Schneider, both of Hillsboro, and Frederick E. Collins, Creswell, all of Oreg., assignors to Jerry L. Wilson, Hillsboro, Oreg.
Filed Jun. 17, 1991, Ser. No. 716,322
Term of patent 14 years
U.S. Cl. D21—191



332,981
PUSHUP STAND
James R. Poli, 629 Beatty Rd., Monroeville, Pa. 15146
Filed Aug. 22, 1990, Ser. No. 570,704
Term of patent 14 years
U.S. Cl. D21—198



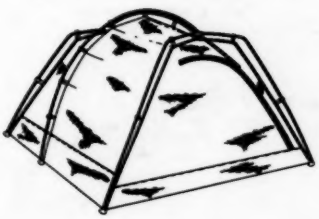
332,982
GAME BALL
Richard Norman; Sonja Norman, both of Sutton, and David Chamberlain, Knowlton, all of Canada, assignors to Profitable Entertainment Products, Inc., Knowlton, Canada
Filed Mar. 15, 1990, Ser. No. 493,673
Term of patent 14 years
U.S. Cl. D21—204

332,983
GROOVED GOLF IRON
Craig D. Dauguard, 9046 Independence, Canoga Park, Calif. 91304
Filed Aug. 11, 1989, Ser. No. 393,312
Term of patent 14 years
U.S. Cl. D21—220

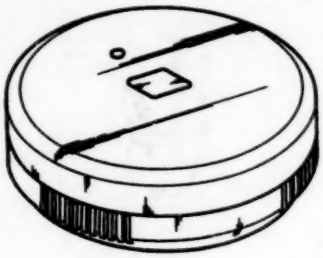
332,984
GOLF CLUB HEAD
Kanji Iinuma, Musashino, and Yuichi Aizawa, Higashikurume, both of Japan, assignors to Daiwa Golf Co., Ltd., Higashikurume, Japan
Filed Aug. 3, 1990, Ser. No. 563,111
Claims priority, application Japan, Feb. 5, 1990, 2-3213
Term of patent 14 years
U.S. Cl. D21—220

D332,985
Patent Not Issued For This Number

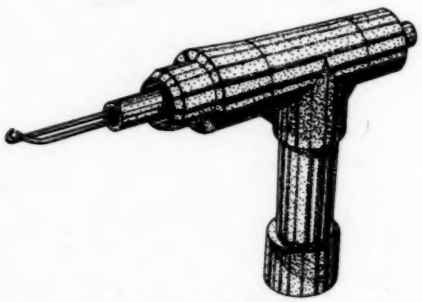
332,986
TENT
Kye S. Choi, Seoul, Rep. of Korea, assignor to Banpo Corporation, Seoul, Rep. of Korea
Filed Jan. 30, 1991, Ser. No. 648,399
Term of patent 14 years
U.S. Cl. D21—253



332,987
ULTRASONIC COCKROACH REPELLENT
Jan Der-Jinn, 12F-3, No. 163, Nanking E. Rd., Sec. 5, Taipei, Taiwan
Filed Oct. 26, 1990, Ser. No. 605,015
Term of patent 14 years
U.S. Cl. D22—120



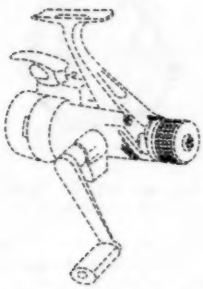
332,988
ELECTRONIC TICK REMOVER
James R. Pacenti, Little Creek Rd., Martins Creek, Pa. 18063
Filed Nov. 15, 1990, Ser. No. 614,736
Term of patent 14 years
U.S. Cl. D22—123



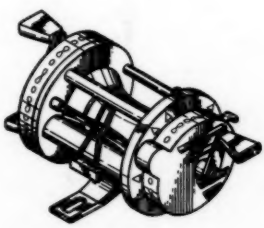
332,989
FISHING LURE
Glenn L. Brown, 976 NW. Lanai Loop, Seal Rock, Oreg. 97376
Filed Mar. 25, 1991, Ser. No. 675,464
Term of patent 14 years
U.S. Cl. D22—128

332,990
TELESCOPIC FISH STUNNING CLUB
John M. Grady, 414 Sandy Bend, Castle Rock, Wash. 98611, and Wayne Roethler, 7419 Willow Grove Rd., Longview, Wash. 98632
Filed Jun. 26, 1990, Ser. No. 544,160
Term of patent 14 years
U.S. Cl. D22—134

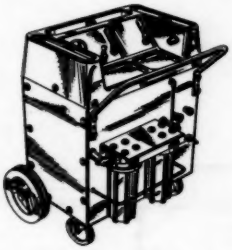
332,991
DRAG SETTING WINDOW FOR A SPINNING FISHING REEL
Richard J. Robbins, Derby, Kans., and Richard J. Feehan, Pawnee, Okla., assignors to Zebco Corporation, Tulsa, Okla.
Filed Sep. 5, 1989, Ser. No. 402,433
Term of patent 14 years
U.S. Cl. D22—141



332,992
AUTOMATIC HOOK SETTING FISH REEL
Wayne E. Mintz, 4898 Enser Rd., Eden, N.Y. 14057
Filed Aug. 8, 1990, Ser. No. 564,299
Term of patent 14 years
U.S. Cl. D22—140

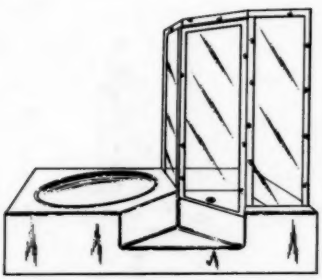


332,993
ANTIFREEZE RECYCLER
William S. Dea, Bloomington; Curt A. Deiner, Prior Lake, and James G. Nyberg, Minneapolis, all of Minn., assignors to Century Mfg. Co., Minneapolis, Minn.
Filed Oct. 30, 1990, Ser. No. 605,771
Term of patent 14 years
U.S. Cl. D23—207

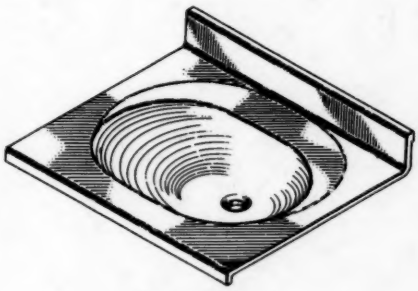


332,994
SHOWER HEAD
Hing-Wah Huen, Kowloon, Hong Kong, assignor to The Fairform Mfg. Co., Ltd., Hong Kong
Filed Apr. 25, 1991, Ser. No. 692,033
Claims priority, application United Kingdom, Nov. 7, 1990, 2010885
Term of patent 14 years
U.S. Cl. D23—223

332,995
COMBINED BATHTUB AND SHOWER STALL
Alan B. Dworetzky, 1108 Redgate Ave., Norfolk, Va. 23507
Filed Apr. 27, 1990, Ser. No. 515,272
Term of patent 14 years
U.S. Cl. D23—275

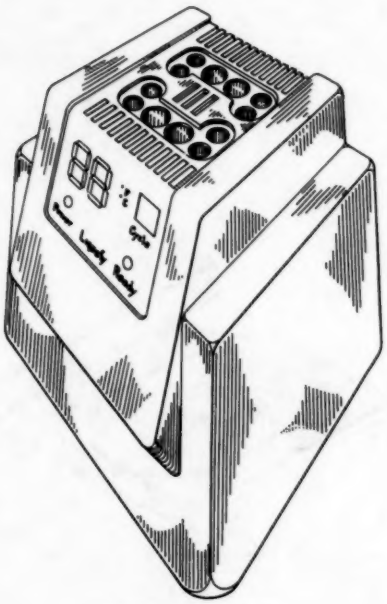


332,996
LAVATORY
Richard S. Hart, Elgin; Jeffrey P. Heuel, Elmhurst, both of Ill.; Thomas R. Nusz, Hockessin, Del., and Richard A. Valiga, Bartlett, Ill., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Jul. 11, 1990, Ser. No. 551,125
Term of patent 14 years
U.S. Cl. D23—294

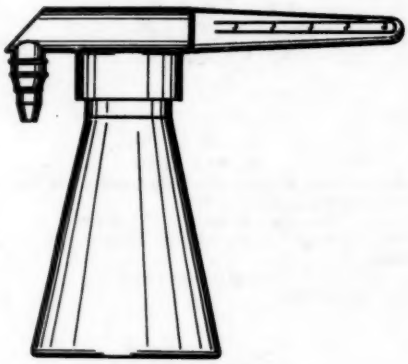


332,997
HEATED TOILET SEAT
Michael Keefe, 5936 S. Spaulding Ave., Chicago, Ill. 60629
Filed Aug. 13, 1990, Ser. No. 565,749
Term of patent 14 years
U.S. Cl. D23—311

332,998
HEATING UNIT FOR USE IN MELTING AND KEEPING HYDROCOLLOID CARTRIDGES IN LIQUID FORM
Robert E. Burridge, Santa Barbara, Calif., assignor to Belport Co., Inc., Camarillo, Calif.
Filed Dec. 31, 1990, Ser. No. 636,992
Term of patent 14 years
U.S. Cl. D23—335

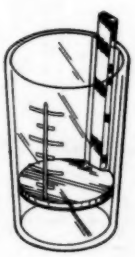


333,000
DISPOSABLE MEDICAL ATOMIZER FOR WOUND IRRIGATION
Gregory W. Good, Fairhope, and Matthew D. Smith, Berlin, both of Pa., assignors to DeVilbiss Health Care, Inc., Somerset, Pa.
Filed Nov. 6, 1990, Ser. No. 611,345
Term of patent 14 years
U.S. Cl. D24—108



332,999
AIR FRESHENER DISPENSER
Earl Hoyt, Franklin Lakes, and Manharbhai K. Patel, Saddle Brook, both of N.J., assignors to Reckitt & Colman Inc., Wayne, N.J.
Filed Jan. 10, 1991, Ser. No. 639,695
Term of patent 14 years
U.S. Cl. D23—367

333,001
COMBINED MIXING CUP AND MIXING ELEMENT THEREFOR
Corydean K. Harvey, P.O. Box 451, Hopkinsville, Ky. 42240
Filed Nov. 14, 1988, Ser. No. 270,284
Term of patent 14 years
U.S. Cl. D24—116



333,002

INTERDENTAL BRUSH HANDLE

Emanuel B. Tarrson, and Dane Maric, both of Chicago, Ill., assignors to John O. Butler Company, Chicago, Ill.

Filed Aug. 14, 1990, Ser. No. 567,534

Term of patent 14 years

U.S. Cl. D24—133

333,003

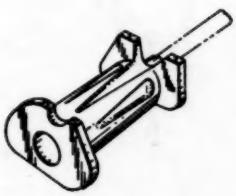
NEEDLE HEAD FOR A BIOPSY CANNULA

Kenneth E. Chettleburgh, Sparta, Mich., assignor to DLP, Inc., Grand Rapids, Mich.

Filed Jul. 31, 1990, Ser. No. 560,327

Term of patent 14 years

U.S. Cl. D24—146



333,004

VENTILATORY INSTRUMENT FOR MEASURING PEAK EXPIRATORY FLOW

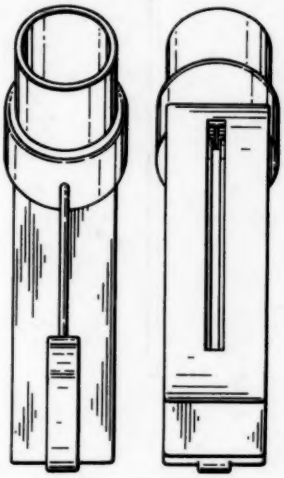
George A. McNamee, Saffron Walden; James A. Stockwell, and Ronald F. Checksfield, both of London, all of England, assignors to Ferraris Development and Engineering Company Limited, London, England

Filed Sep. 28, 1990, Ser. No. 589,891

Claims priority, application United Kingdom, Mar. 29, 1990, 2005774

Term of patent 14 years

U.S. Cl. D24—164



333,005

TRANSPORTABLE OXYGEN THERAPY UNIT

Dale M. Taylor, Salt Lake City, Utah, assignor to Ceramatec, Inc., Salt Lake City, Utah

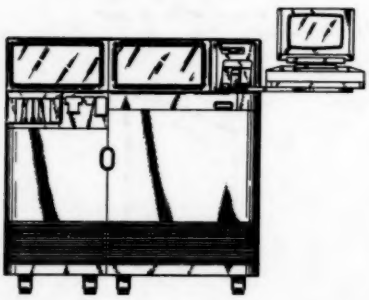
Filed Oct. 30, 1990, Ser. No. 606,336

Term of patent 14 years

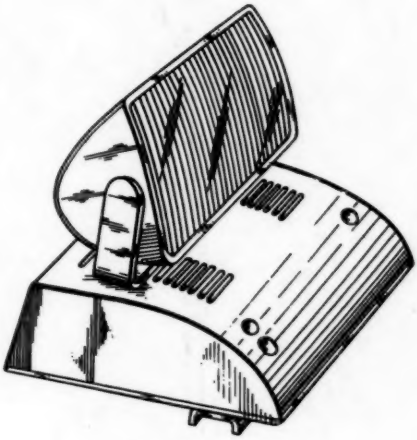
U.S. Cl. D24—164

333,006
AUTOMATIC LATEX TUBE TOURNIQUET
Sai Y. Tam, G.P.O. Box 11071, Hong Kong, Hong Kong
Filed Aug. 15, 1990, Ser. No. 568,313
Term of patent 14 years
U.S. Cl. D24—169

333,007
CLINICAL ANALYZER
Angelo LaBarbera, Honeoye, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 17, 1990, Ser. No. 628,755
Term of patent 14 years
U.S. Cl. D24—232

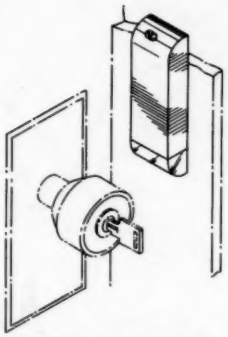


333,008
ADJUSTABLE EXTERIOR LIGHT
John S. Frost; David P. Tanner, both of Thousand Oaks, Calif., and Ronald L. Sitzema, Jr., Ellsworth, Mich., assignors to Siemens Solar Industries, L. P., Camarillo, Calif.
Filed Jan. 4, 1991, Ser. No. 637,882
Term of patent 14 years
U.S. Cl. D26—63



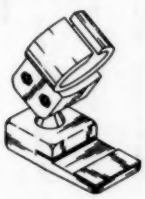
333,009
FLOODLIGHT
Kent A. Solberg, Racine, and Donald Wandler, Caledonia, both of Wis., assignors to Ruud Lighting, Inc., Racine, Wis.
Filed Feb. 8, 1991, Ser. No. 652,908
Term of patent 14 years
U.S. Cl. D26—68

333,010
DOORJAMB LIGHT
Robert I. Lowe, Sr., Rte. 1, Box 73-C, Islandton, S.C. 29929
Filed Jun. 15, 1989, Ser. No. 366,402
Term of patent 14 years
U.S. Cl. D26—72

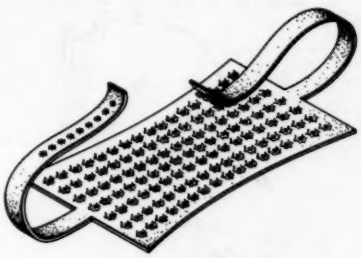


333,011
LUMINAIRE
Robert L. Ewing, Granville; Peter A. Koloski, Columbus; Robert J. Hayes, Gahanna; Richard J. Malecha, Delaware, and David G. Meredith, Westerville, all of Ohio, assignors to Holophane Company, Inc., Newark, Ohio
Filed Apr. 20, 1990, Ser. No. 513,332
Term of patent 14 years
U.S. Cl. D26—88

333,012
FLASHLIGHT HOLDER
James Fleming, 140 Sherry La., Kalispell, Mont. 59901
Filed Dec. 12, 1989, Ser. No. 448,824
Term of patent 14 years
U.S. Cl. D26—138

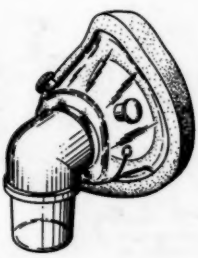


333,013
HAIR FROSTING BAND FOR THE HEAD
Chris C. Scianna, 29 Johnson Ave., Medford, Mass. 02155
Filed Jul. 26, 1990, Ser. No. 559,556
Term of patent 14 years
U.S. Cl. D28—20



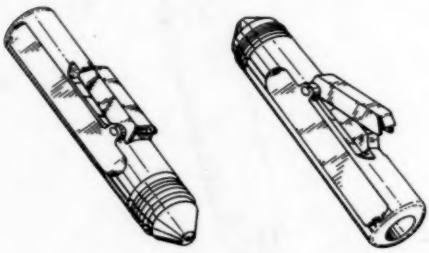
333,014
DISPENSING CONTAINER FOR A COSMETIC PRODUCT
Frank J. Lang, Henderson, Nev., assignor to Federal Package, Ltd., Chaska, Minn.
Filed Oct. 26, 1990, Ser. No. 603,858
Term of patent 14 years
U.S. Cl. D28—76

333,015
NASAL MASK
Robert B. Farmer, Boulder, and R. Scott St. John, Golden, both of Colo., assignors to Lifecare International, Inc., Lafayette, Colo.
Filed Dec. 2, 1991, Ser. No. 801,175
Term of patent 14 years
U.S. Cl. D29—8



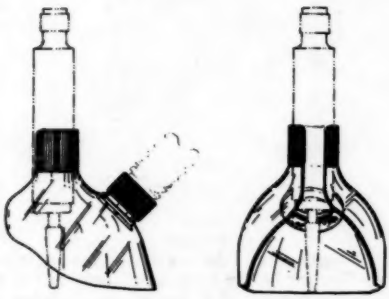
333,016
HAND RESTRAINT MITT
Linda J. Lambert, P.O. Box 505, Whittier, N.C. 28789
Filed May 31, 1990, Ser. No. 532,974
Term of patent 14 years
U.S. Cl. D29—20

333,017
ANIMAL WATERING VALVE
Goran Karlsson, Enhorna, Sweden, assignor to Alfa-Laval Agri Scandinavia, Sodertalje, Sweden
Filed Mar. 13, 1990, Ser. No. 492,878
Claims priority, application Sweden, Sep. 14, 1989, 89-2066
Term of patent 14 years
U.S. Cl. D30—132

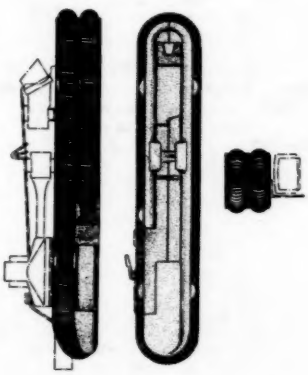


333,018
FLOOR POLISHER
Eugene L. Bothun, Loveland; Frederick M. Bores, Highlands Ranch, and Edward T. Biegel, Littleton, all of Colo., assignors to Windsor Industries, Inc., Englewood, Colo.
Filed Oct. 15, 1990, Ser. No. 597,768
Term of patent 14 years
U.S. Cl. D32—19

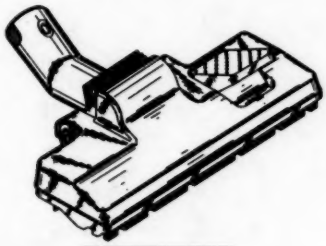
333,019
SAFETY VACUUM SHIELD
Robert S. Whitman, 2714 Northview Rd., Philadelphia, Pa. 19152
Filed Sep. 4, 1990, Ser. No. 577,587
Term of patent 14 years
U.S. Cl. D32—31



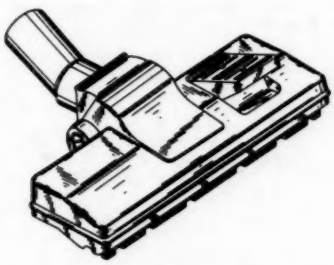
333,020
COMBINED VACUUM CLEANER HOSE AND RACK
Darwin T. McKnight, Louisville, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Apr. 29, 1991, Ser. No. 692,517
Term of patent 14 years
U.S. Cl. D32—31



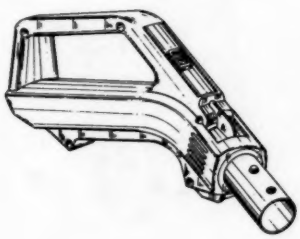
333,021
SUCTION CLEANER NOZZLE
Jacob Breur, Peize, Netherlands, assignor to Wessel-Werk GmbH, Reichshof, Fed. Rep. of Germany
Filed Sep. 1, 1989, Ser. No. 402,142
Term of patent 14 years
U.S. Cl. D32—32



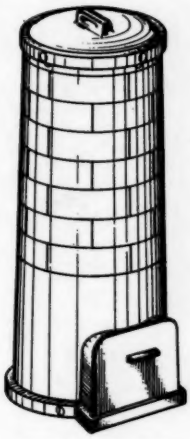
333,022
SUCTION CLEANER NOZZLE
Wilfried Kramer, Reichshof-Odenspiel; Klaus-Dieter Riehl, Drolshagen-Brachtpe, and Otto Illesy, Reichshof-Erdingen, all of Fed. Rep. of Germany, assignors to Wessel-Werk GmbH & Co. Kommanditgesellschaft, Reichshof, Fed. Rep. of Germany
Filed Sep. 1, 1989, Ser. No. 402,143
Term of patent 14 years
U.S. Cl. D32—32



333,023
VACUUM CLEANER HOSE HANDLE
Roy H. Herron, Jr., Starr, S.C., assignor to Ryobi Motor Products Corp., Easley, S.C.
Filed Oct. 10, 1990, Ser. No. 595,012
Term of patent 14 years
U.S. Cl. D32—34

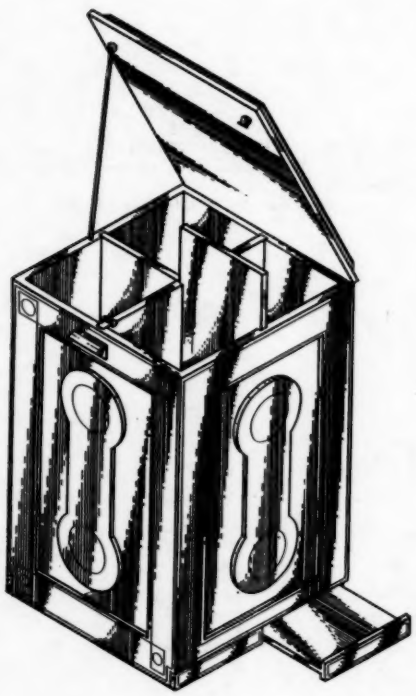


333,024
COMPOST CONTAINER
Jan van Buiten, Lunteren, Netherlands, assignor to N.V. Vuilafvoer Maatschappij VAM, Netherlands
Filed Sep. 17, 1991, Ser. No. 761,021
Term of patent 14 years
U.S. Cl. D34—1

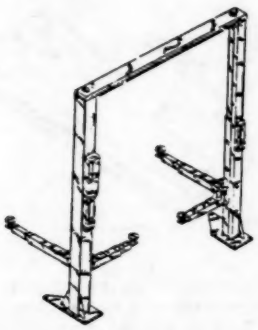


333,025
TRASH CONTAINER
Jean Doherty, 331 Division Ave., Hasbrouck Heights, N.J. 07604-1721
Filed Mar. 27, 1991, Ser. No. 675,709
Term of patent 14 years
U.S. Cl. D34—7

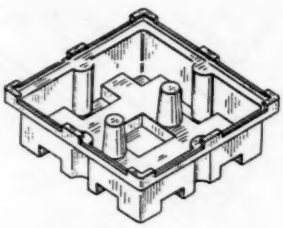
333,026
DIVIDED AND COMPARTMENTED TRASH CONTAINER
Janet L. Befus, 37 Woodland Dr., Northford, Conn. 06472
Filed Apr. 4, 1991, Ser. No. 680,685
Term of patent 14 years
U.S. Cl. D34—7



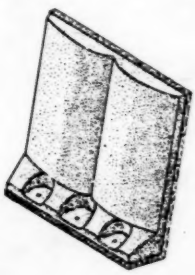
333,027
COMBINED HOISTING PLATFORM AND CONTROL CONSOLE THEREFOR
Hans Nussbaum, Korkerstrasse 24, 7640 Kehl-Bodersweier, Fed. Rep. of Germany
Filed Jul. 26, 1991, Ser. No. 736,893
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1991, M 9100946.4
Term of patent 14 years
U.S. Cl. D34—33



333,028
PALLET CONTAINER
Robert J. Lux, Jr., Broken Arrow, Okla., assignor to Armin Thermodynamics Corporation, Broken Arrow, Okla.
Filed Jul. 24, 1991, Ser. No. 735,361
Term of patent 14 years
U.S. Cl. D34—38



333,029
GRAVE MARKER
Debra J. Hartline, 113 Cemetery St., Lilly, Pa. 15938
Filed May 9, 1990, Ser. No. 520,863
Term of patent 14 years
U.S. Cl. D99—17



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF FEBRUARY, 1993

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Isaksson, Juhani, 5,183,641, Cl. 422-143.000.

A. H. Robins Company, Incorporated: *See*—
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; and Stauffer, Harold F., Jr., 5,183,902, Cl. 548-950.000.
Welstead, William J., Jr.; and Lo, Young S., 5,183,903, Cl. 548-952.000.

A. Nattermann & Cie. GmbH Corporation of the Federal Republic of Germany: *See*—
Jodlbauer, Heinz D., 5,183,680, Cl. 426-611.000.

Aaronson, Alan M.; and Bright, Danielle A., to Akzo NV. Phenolphthalein bis (dihydrocarbyl phosphate) compounds. 5,183,905, Cl. 549-218.000.

Aaronson, Stuart A.: *See*—
Kraus, Matthias H.; and Aaronson, Stuart A., 5,183,884, Cl. 536-23.500.

ABB Lummus Crest Inc.: *See*—
Reilly, James W.; and Hamilton, Gary, 5,183,556, Cl. 208-57.000.

ABB Power T&D Company, Inc.: *See*—
Boyd, Edward L.; Eley, E. R.; and Puri, Jeewan L., 5,184,270, Cl. 361-35.000.

Abbott Laboratories: *See*—
Brooks, Dee W.; Stewart, Andrew O.; and Martin, Jonathan G., 5,183,818, Cl. 514-231.500.

Abdelmouttalib, Najib; and Duflot, Didier, to Bull, S.A. ISDN multiprotocol communications controller. 5,184,348, Cl. 370-95.100.

Abe, Kazuto: *See*—
Maruyama, Satoshi; Minorikawa, Naoki; Arakawa, Tsutomu; Yoshida, Haruo; Tagoshi, Hirotaka; and Abe, Kazuto, 5,183,917, Cl. 558-251.000.

Abe, Minoru; and Takano, Tetsuji, to Kabushiki Kaisha Daikin Seisakusho. Release mechanism for pull-type clutch. 5,183,141, Cl. 192-91.00A.

Abe, Toshihiko, to Japan as represented by Director General of Agency of Industrial Science and Technology. Method for forming and ultrasonic image. 5,183,049, Cl. 128-663.010.

Abe, Tsuyoshi; Umezawa, Nobumasa; Fukuzumi, Tatsuo; Uchibori, Katsuyuki; Ozaki, Junji; and Motomura, Hiroharu, to Mitsubishi Steel Mfg. Co., Ltd. High strength spring steel. 5,183,634, Cl. 420-110.000.

Abeille, Pierre; and Bredif, Didier, to Schlumberger Industries. Coupling for axially locking a reel of a tape cassette and for driving it without backlash. 5,183,219, Cl. 242-68.100.

Abou-Gharbia, Magid A. M.; and Moyer, John A., to American Home Products Corporation. Use of fused bicyclic imides in the treatment of various CNS disorders. 5,183,819, Cl. 514-255.000.

Abtox, Inc.: *See*—
Campbell, Bryant A., 5,184,046, Cl. 315-111.210.

Acerno, Michael J.; and Guarino, Mark A. Sulky. 5,183,279, Cl. 280-63.000.

Acker, Gregory G.: *See*—
Burkholder, Richard A.; and Acker, Gregory G., 5,183,054, Cl. 128-754.000.

Ackerman, Yuri; and Gutierrez, Joseph A., to Chicago Rawhide Manufacturing Co. Seal for sending unit. 5,183,267, Cl. 277-12.000.

Acona, Bruce; and Ancona, Jane, to M. Kamenstein, Inc. Kitchen storage unit. 5,183,165, Cl. 211-77.000.

Acuderm, Inc.: *See*—
Yeh, Charles R.; and Huldin, Donald H., 5,183,053, Cl. 128-754.000.

Adachi, Etsushi: *See*—
Aiba, Yoshiko; Adachi, Hiroshi; and Adachi, Etsushi, 5,183,846, Cl. 524-865.000.

Adachi, Hiroshi: *See*—
Aiba, Yoshiko; Adachi, Hiroshi; and Adachi, Etsushi, 5,183,846, Cl. 524-865.000.

Adachi, Masakazu; Saitou, Toshimitu; Murata, Kimiyo; and Tamura, Aki, to Japan Immuno Research Laboratories Co., Ltd. Kit for the detection of denatured lipoproteins. 5,183,738, Cl. 435-7.100.

Adam, Maurice: *See*—
Alivizatos, Margaret A., 5,182,828, Cl. 5-631.000.

Adams, Bruce E.: *See*—
Wickersheim, Kenneth A.; and Adams, Bruce E., 5,183,338, Cl. 374-131.000.

Adams, James W.; Loving, Louis S.; Betts, David A.; Donnelly, David P.; and Nunley, Alvin, III, to Techsonic Industries, Inc. Multi-beam sonar fish detection apparatus providing real-time three-dimensional wire-frame display representation. 5,184,330, Cl. 367-111.000.

Adams, Jonah, Jr.: *See*—
Rinehart, Steven R.; and Adams, Jonah, Jr., 5,183,523, Cl. 156-367.000.

Adams, Lawrence J.: *See*—
Lodico, James I.; Coder, David R.; Adams, Lawrence J.; Guthrie, Rebecca A. F.; Andes, Raymond M., Jr.; and Alexander, Philip G., 5,183,487, Cl. 55-289.000.

Adams, Michael B., to Brazeway, Incorporated. Opposed canted evaporator. 5,183,105, Cl. 165-140.000.

Adco Products Inc.: *See*—
Fisher, Dennis K.; and Briddell, Brian J., 5,183,833, Cl. 522-182.000.

Addison, F. Clark; and Thorstensen, Peder J. Heat reduction liquid volume compensator. 5,183,995, Cl. 219-433.000.

Adkins, Joey B.: *See*—
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Adler, Jonathan M.; Monahan, Russell E.; and Frayer, Robert W., Jr., to NTN Technical Center, (U.S.A.) Inc. Rotational speed sensor utilizing magnetic ink tone ring. 5,184,069, Cl. 324-207.220.

Adonakis, Nikolaos A.: *See*—
Wilhelm, Richard D.; and Adonakis, Nikolaos A., 5,183,974, Cl. 181-0.500.

Advanced Interconnections Corporation: *See*—
Murphy, James V.; and Murphy, Michael J., 5,184,285, Cl. 361-421.000.

Advanced Micro Devices, Inc.: *See*—
DiNapoli, Antonio; Goff, Gerald L.; and Sikes, Roger A., 5,183,245, Cl. 269-254.00R.
Fung, Jimmy; An, Jiu; Campbell, David L.; and Shyu, Steven, 5,184,129, Cl. 341-144.000.

Aerochem Research Laboratories, Inc.: *See*—
Felder, William, 5,183,481, Cl. 55-15.000.

Aeromix Systems, Incorporated: *See*—
Rajendren, Richard; Gross, Peter S.; and Bollensen, Eric G., 5,183,596, Cl. 261-93.000.

Aeroquip Corporation: *See*—
Allread, Alan R.; Chichester, Dennis B.; Rogers, Russell L.; and Knowles, Steven M., 5,182,922, Cl. 62-239.000.

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Cohen, Amir, 5,183,208, Cl. 239-542.000.

Aharoni, Shaul M., to Allied-Signal Inc. Fluoropolymers and fluoropolymer coatings. 5,183,839, Cl. 524-113.000.

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Erdman, Arthur G.; Rekow, Elizabeth D.; Riley, Donald R.; Klamecki, Barney; Zhu, Yang; and Ahn, Jeong-Ho, 5,184,306, Cl. 364-474.050.

Aiba, Yoshiko; Adachi, Hiroshi; and Adachi, Etsushi, to Mitsubishi Denki Kabushiki Kaisha. Silicone ladder polymer coating composition. 5,183,846, Cl. 524-865.000.

Aichi Sharyo Co. Ltd.: *See*—
Fujimoto, Mineyuki, 5,183,168, Cl. 212-232.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Akahoshi, Sumihisa; Akimura, Hitoshi; Nakabayashi, Isao; Ishii, Masami; Ohi, Tamio; and Yoshida, Makoto, 5,183,591, Cl. 252-503.000.
Goto, Shigeki, 5,182,969, Cl. 74-866.000.
Goto, Shigeki; Shimei, Masato; Miyazawa, Tetsuhiro; Saitou, Yoshitami; and Isono, Nobuyuki, 5,182,970, Cl. 74-866.000.
Koga, Yoshitaka; and Sugiura, Sadao, 5,183,308, Cl. 296-75.000.

Ajiki, Yoshio: *See*—
Fujii, Isao; Ajiki, Yoshio; Ishida, Yoichi; and Matsuura, Hiromi, 5,183,011, Cl. 123-1.00A.

Ajroldi, Giuseppe: *See*—
Visani, Francesco; Tavazzani, Carlo; Ajroldi, Giuseppe; and Castiglioni, Giovanni, 5,183,851, Cl. 525-85.000.

Akahoshi, Sumihisa; Akimura, Hitoshi; Nakabayashi, Isao; Ishii, Masami; Ohi, Tamio; and Yoshida, Makoto, to Ube Cycon, Ltd.; and Aisin Seiki Kabushiki Kaisha. Electroconductive resin composition. 5,183,591, Cl. 252-503.000.

Akasaka, Yoshimichi; Nakamura, Ichiro; and Gotoh, Yasuharu, to Hitachi Construction Machinery Co., Ltd. Bent axis type variable displacement hydraulic machine. 5,182,978, Cl. 91-499.000.

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Kiuchi, Manabu; and Arai, Masao, 5,183,632, Cl. 419-48.000.
Maeda, Kazuo; and Kinoshita, Koichi, 5,183,136, Cl. 188-73.440.

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Kiuchi, Manabu; and Arai, Masao, 5,183,632, Cl. 419-48.000.

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Akahoshi, Sumihisa; Akimura, Hitoshi; Nakabayashi, Isao; Ishii, Masami; Ohi, Tamio; and Yoshida, Makoto, 5,183,591, Cl. 252-503.000.

Akiyama, Koichi: *See*—
Ichihashi, Tadashi; and Akiyama, Koichi, 5,184,157, Cl. 351-208.000.

Akutsu, Kotaro: *See*—
Ohishi, Shinji; Akutsu, Kotaro; and Saksi, Toshikazu, 5,184,055, Cl. 318-615.000.

Akzo NV: *See*—
Aaronson, Alan M.; and Bright, Danielle A., 5,183,905, Cl. 549-218.000.

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Mrozowski, Joseph E.; Fusco, Jeffery K.; and Albaisa, Alfonso, 5,183,192, Cl. 224-42.210.

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Hull, Charles W.; Spence, Stuart T.; Albert, David J.; Smalley, Dennis R.; Harlow, Richard A.; Stinebaugh, Phil; Tarnoff, Harry L.; Nguyen, Hop D.; Lewis, Charles W.; Vorgitch, Tom J.; and Remba, David Z., 5,184,307, Cl. 364-474.240.

Albizzati, Enrico: *See*—
Guerra, Gaetano; Vitagliano, Vincenzo M.; Corradini, Paolo; and Albizzati, Enrico, 5,183,853, Cl. 525-132.000.

Albright & Wilson Ltd.: *See*—
Holmes, William S.; and Marshall, Robert, 5,183,649, Cl. 423-300.000.

Alcatel Australia Limited: *See*—
Stanbury, Evan J.; and Thomas, Lloyd S., 5,184,119, Cl. 340-825.600.

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Brehm, Claude; Dupont, Philippe; and Tardy, Andre , 5,183,489, Cl. 65-4.200.

Alcatel Transmission par Faisceaux Hertziens: *See*—
Brouzes, Carole; Ressencourt, Claude; and de Place, Alain, 5,184,097, Cl. 333-202.000.

Aldous, Stephen C.; and Dake, Guy M., to Megahertz Corporation. Systems for connection of physical/electrical media connectors to computer communications cards. 5,183,404, Cl. 439-55.000.

Alexander, Philip G.: *See*—
Lodico, James I.; Coder, David R.; Adams, Lawrence J.; Guthrie, Rebecca A. F.; Andes, Raymond M., Jr.; and Alexander, Philip G., 5,183,487, Cl. 55-289.000.

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Aliverti, Valerio; Dorigotti, Luciano; Fonio, Teodoro; and Pinza, Mario, to ISF Societa per Azioni. Pharmaceutical compositions for intranasal administration of calcitonin. 5,183,802, Cl. 514-2.000.

Alivizatos, Margaret A., to Adam, Maurice. Roll preventing structures. 5,182,828, Cl. 5-631.000.

Allergan, Inc.: *See*—
Chandraratna, Roshantha A. S., 5,183,827, Cl. 514-444.000.
Lee, Gary C. M.; Garst, Michael E.; and Sachs, George, 5,183,906, Cl. 549-218.000.

Alliant Techsystems Inc.: *See*—
Shaklee, Kerry L., 5,184,154, Cl. 346-110.00R.

Allied-Signal Inc.: *See*—
Aharoni, Shaul M., 5,183,839, Cl. 524-113.000.
Alten, Charles J.; Cuccio, John S., Jr.; Kington, Harry L.; and Fontana, James D., 5,183,270, Cl. 277-81.00R.
Chary, Henry H., 5,182,960, Cl. 74-417.000.
Chary, Henry H.; Fitgibbon, Thomas F.; and Gibson, Christopher M., 5,183,150, Cl. 198-782.000.
Huggett, Colin E.; and Wuertz, Kenneth L., 5,183,387, Cl. 416-147.000.
Stancliffe, A. Colin; Vidano, Paul; and Pogue, Bill P., 5,183,106, Cl. 165-166.000.
Wang, Li; and Mitsche, Roy T., 5,183,792, Cl. 502-242.000.

Allman, Steve L.; Chen, Chung-Hsuan; and Chen, Fang C., to Martin Marietta Energy Systems, Inc. Charged particle mobility refrigerant analyzer. 5,184,015, Cl. 250-282.000.

Allmendinger, Franz; Ebner, Arno; Ettischer, Helmut; and Straub, Timo, to Eastman Kodak Company. Device for stapling sheets individually supplied and deposited on a stack. 5,183,195, Cl. 227-29.000.

Allread, Alan R.; Chichester, Dennis B.; Rogers, Russell L.; and Knowles, Steven M., to Aeroquip Corporation. Automotive air-conditioning system. 5,182,922, Cl. 62-239.000.

Allwaste Services, Inc.: *See*—
Fanta, David E.; Hamby, Johnnie L.; and Schleicher, Hart E., 5,183,086, Cl. 141-10.000.

Alps Electric Co., Ltd.: *See*—
Kanai, Yasushi; Takano, Hiroe; Saoshita, Shushi; and Nitta, Atsumi, 5,184,266, Cl. 360-120.000.

Alsip, Ron. Toilet seat clock apparatus. 5,182,823, Cl. 4-661.000.

Alt, Claus-Christian, to Mercedes-Benz AG. Arrangement of a differential for driving two vehicle wheels. 5,183,445, Cl. 475-230.000.

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Alvarez, David G.: *See*—
Dighton, Gaylon L.; and Alvarez, David G., 5,182,870, Cl. 34-26.000.

Alvarez-Ossorio, Rafael P.: *See*—
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; De Gamboa, Cristina R. F.; Garcia, Jesus G.; and Berlanga, Jose M. C., 5,183,821, Cl. 514-296.000.

Alvarez, Robert J.; Bredesen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., to Mile High Equipment Company. Integrally formed, modular ice cuber having a stainless steel evaporator and microcontroller. 5,182,925, Cl. 62-347.000.

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Sartorio, Franco; Prunotto, Gianpaolo; Sgandurra, Francesco; and Arghiracopulos, Salvatore, 5,182,936, Cl. 72-420.000.

Amada, Eiichi: *See*—
Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, 5,184,346, Cl. 370-60.000.

Amano Corporation: *See*—
Suzuki, Masato, 5,183,345, Cl. 400-211.000.

Amberson, James R.; Ehlert, William C.; and Olson, George E., to Armco Inc. Telephone enclosure. 5,182,883, Cl. 52-73.000.

Amerada Hess Corporation: *See*—
Baughner, Murphy D.; Padilla, Paul J.; and Bowling, Floyd A., 5,182,946, Cl. 73-151.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A. M.; and Moyer, John A., 5,183,819, Cl. 514-255.000.
Kees, Kenneth L., 5,183,825, Cl. 514-404.000.

Amkor Electronics, Inc.: *See*—
Johnson, Frank J., 5,183,724, Cl. 430-312.000.

Amoco Corporation: *See*—
Fjare, Douglas E.; Beuhler, Allyson J.; and Navar, Cynthia A., 5,183,534, Cl. 156-668.000.
Harper, Jon J.; Kuhlmann, George E.; Larson, Keith D.; McMahon, Rosemary F.; and Sanchez, Paul A., 5,183,933, Cl. 562-414.000.
Higginbotham, Jeff A.; Garcia, George; and Richards, Robert L., 5,183,340, Cl. 384-420.000.

Amos, Dennis R., to Westinghouse Electric Corp. Method of forming a trailing edge on a steam turbine blade and the blade made thereby. 5,183,390, Cl. 416-224.000.

AMP Incorporated: *See*—
Elicker, Robert W.; and Gorenc, Daniel L., 5,183,405, Cl. 439-108.000.

An, Chang N.: *See*—
Lee, Ho W.; Riu, Sun J.; and An, Chang N., 5,183,658, Cl. 424-89.000.

An, Jiu: *See*—
Fung, Jimmy; An, Jiu; Campbell, David L.; and Shyu, Steven, 5,184,129, Cl. 341-144.000.

Analog Devices, Incorporated: *See*—
Mangelsdorf, Christopher W., 5,184,130, Cl. 341-156.000.

Ancona, Jane: *See*—
Acona, Bruce; and Ancona, Jane, 5,183,165, Cl. 211-77.000.

Anderson, Brent C.: *See*—
Frenkel, Jeffry T.; and Anderson, Brent C., 5,182,941, Cl. 73-40.000.

Anderson, Eric D.: *See*—
Anderson, Robert A.; and Anderson, Eric D., 5,183,953, Cl. 42-96.000.

Anderson, Jeffrey J.: *See*—
MacLane, Donald B.; Deur, Ted E.; Anderson, Jeffrey J.; Titterington, Donald R.; Oswald, James C.; and Meissner, Richard S., 5,184,147, Cl. 346-1.100.

Anderson, Lawrence B.; Hammon, Timothy E.; and Frieler, Cliff, to Custom Engineered Materials, Inc. Incinerator for complete oxidation of impurities in a gas stream. 5,183,646, Cl. 423-210.000.

Anderson Manufacturing Company, Inc.: *See*—
Anderson, Robert A.; and Anderson, Eric D., 5,183,953, Cl. 42-96.000.

Anderson, Paul S.: *See*—
Saari, Walfred S.; Rodan, Gideon A.; Fisher, Thorsten E.; and Anderson, Paul S., 5,183,815, Cl. 514-172.000.

Anderson, Robert A.; and Anderson, Eric D., to Anderson Manufacturing Company, Inc. Flexible cover/guard for rifle and piston scopes having a resilient protective inner portion and a fabric outer portion secured thereto. 5,183,953, Cl. 42-96.000.

Andersson, Jan: *See*—
Martensson, Lars; and Andersson, Jan, 5,183,644, Cl. 422-304.000.

Anderton, Peter W.: *See*—
Taft, Morris E.; Anderton, Peter W.; and Maguire, Roy L., 5,183,318, Cl. 305-39.000.

Andes, Raymond M., Jr.: *See*—
Lodico, James I.; Coder, David R.; Adams, Lawrence J.; Guthrie, Rebecca A. F.; Andes, Raymond M., Jr.; and Alexander, Philip G., 5,183,487, Cl. 55-289.000.

Andoh, Masako: *See*—
Morita, Yasushi; Ohtori, Akira; and Andoh, Masako, 5,183,662, Cl. 424-426.000.

Andre, Jean-Claude: *See*—
Helle, Jean-Louis; Andre, Jean-Claude; and Schaeffer, Philippe, 5,183,598, Cl. 264-22.000.

Angerbauer, Rolf; Fey, Peter; Hubsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; and Schmidt, Delf, to Bayer Aktiengesellschaft. Certain intermediate imino-substituted pyridines. 5,183,897, Cl. 546-330.000.

Ansell, Christopher W. G., to Smith and Nephew Associated Companies p.l.c. Thin film adhesive dressings preparation and use. 5,183,664, Cl. 424-445.000.

Anthony, James R.; and Wiseman, Michael A., to Indiana Mills & Manufacturing, Inc. Belt buckle with ejector module and tongue stop. 5,182,837, Cl. 24-642.000.

Antonious, Anthony J. Golf club with improved hosel construction. 5,183,255, Cl. 273-167.00G.

Anzai, Fukuji, to Sanyo Electric Co., Ltd. Head amplifier. 5,184,090, Cl. 330-294.000.

Aoki, Norihiko: *See*—
Tsuchida, Hirofumi; and Aoki, Norihiko, 5,184,251, Cl. 359-654.000.

Aoki, Shinobu; Takagi, Haruo; and Okabe, Takanori, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Static induction transistor. 5,184,201, Cl. 257-266.000.

Aoyama, Hiroyuki: *See*—
Nakajima, Shin; Aoyama, Hiroyuki; Kagawa, Rihito; and Shimoe, Osamu, 5,184,085, Cl. 328-65.000.

Applied Analytical Industries, Inc.: *See*—
Caldwell, Henry C., 5,183,829, Cl. 514-570.000.

Applied Biosystems, Inc.: *See*—
Bergot, B. John, 5,183,885, Cl. 536-25.410.

Applied Hydro Dynamics, Inc.: *See*—
Sajewski, Ronald, 5,183,513, Cl. 134-22.120.

Applied Materials, Inc.: *See*—
Levy, Karl B., 5,183,775, Cl. 437-60.000.

Aquotech, Inc.: *See*—
Bragger, Barry L., 5,183,512, Cl. 134-1.000.

Aragon, William G., Jr. Motion sensitive, fiber optic, strike indicating fishing rod assembly. 5,182,873, Cl. 43-17.000.

Arai, Fuminori; and Katsuyama, Harumi, to Fuji Photo Film Co., Ltd. Integral multilayer element for glucose analysis. 5,183,741, Cl. 435-14.000.

Arai, Fumio: *See*—
Yamaguchi, Akira; Uno, Masaru; Sekikawa, Norio; Arai, Fumio; and Matsuzaki, Kenji, 5,183,484, Cl. 55-34.000.

Arai, Kozo: *See*—
Goto, Yoshiaki; and Arai, Kozo, 5,183,650, Cl. 423-710.000.

Arai, Masao: *See*—
Kiuchi, Manabu; and Arai, Masao, 5,183,632, Cl. 419-48.000.

Arai, Michio. Shield mounting structure for helmet. 5,182,816, Cl. 2-424.000.

Arai, Takeji, to Fanuc Ltd. Method of welding galvanized steel sheets with a laser beam. 5,183,991, Cl. 219-121.640.

Arai, Tsutomu: *See*—
Uesaka, Kazuo; Okita, Kazumasa; and Arai, Tsutomu, 5,183,656, Cl. 424-76.100.

Arakawa, Mitsuaki; and Hawryszko, Christine, to University of California, The Regents of the. Real-time MR imaging inside gantry room. 5,184,074, Cl. 324-309.000.

Arakawa, Tsutomu: *See*—
Maruyama, Satoshi; Minorikawa, Naoki; Arakawa, Tsutomu; Yoshida, Haruo; Tagoshi, Hirotaka; and Abe, Kazuto, 5,183,917, Cl. 558-251.000.

Aralt, Per T. Arrangement for loading and unloading of heavy packages. 5,183,376, Cl. 414-592.000.

Arbanas, Zeljko: *See*—
Samarov, Victor M.; and Arbanas, Zeljko, 5,184,281, Cl. 361-386.000.

Arghiracopulos, Salvatore: *See*—
Sartorio, Franco; Prunotto, Gianpaolo; Sgandurra, Francesco; and Arghiracopulos, Salvatore, 5,182,936, Cl. 72-420.000.

Arima, Hidetoshi, to Tokai Kogyo Kabushiki Kaisha. Apparatus and process for a manufacturing a weather strip. 5,183,522, Cl. 156-244.130.

Arimoto, Kazutami: *See*—
Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,184,327, Cl. 365-201.000.

Ariyama, Tatsuro; Isozaki, Shinichi; Yamada, Kenzo; Matsuo, Masahiro; and Kanatani, Genji, to NKK Corporation. Method for controlling a flow rate of gas for prereducing ore and apparatus therefor. 5,183,495, Cl. 75-379.000.

Armbruster, Horst, to Behr GmbH & Co. Heat exchanger. 5,182,856, Cl. 29-890.039.

Armco Inc.: *See*—
Amberson, James R.; Ehlert, William C.; and Olson, George E., 5,182,883, Cl. 52-73.000.

Armstrong World Industries, Inc.: *See*—
Bohrn, Walter J.; Diffenbaugh, Kimberly S.; Garman, Shelly N.; and Khanpara, Jatin C., 5,183,704, Cl. 428-305.500.

Arnold & Richter Cine Technik GmbH & Co. Betriebs KG: *See*—
Grosser, Claus, 5,184,158, Cl. 352-226.000.

Arzouman, Harry H.; and Slay, Clyde E., to Safe-T-Jack, Inc. Apparatus for aligning and releasing a two-part jack system. 5,183,235, Cl. 254-8.00B.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, 5,183,857, Cl. 525-285.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Furuya, Katsuhiko; and Takahashi, Tadashi, 5,184,159, Cl. 354-62.000.
Kirigaya, Tadayuki, 5,184,173, Cl. 354-471.000.
Takahashi, Tadashi; Furuya, Katsuhiko; Nakasima, Masaaki; and Enomoto, Takayuki, 5,184,170, Cl. 354-413.000.

Asakura, Eizo: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Kitano, Motoi; Nakatani, Yoshio; Yoshida, Hideyuki; Hatta, Toshiya; and Nakatani, Seiichi, 5,183,594, Cl. 252-518.000.

Asano, Kenichi: *See*—
Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, 5,184,346, Cl. 370-60.000.

Asano, Takanobu; and Ishii, Katsumi, to Tokyo Electron Sagami Limited. Wafer counter having device for aligning wafers. 5,183,378, Cl. 414-757.000.

Ashelin, Brian T.; Bergquist, Mark A.; and Noltee, Dennis E., Sr., to International Business Machines Corporation. Method and apparatus for implementing engineering changes for integrated circuit module. 5,184,284, Cl. 361-400.000.

Asmussen, Erik; Munksgaard, Erik C.; Muller, Michael; Podszun, Wolfgang; and Winkel, Jens, to Bayer Aktiengesellschaft. Coating agent for collagen-containing materials. 5,183,832, Cl. 522-84.000.

Aso, Toshiyuki; and Yoda, Shinji, to Fanuc Ltd. Cut-out piece removing method in electric discharge machining and an apparatus therefor. 5,183,987, Cl. 219-69.120.

Associated Synapse Biologics: *See*—
Borodic, Gary E., 5,183,462, Cl. 604-51.000.

Asten Group, Inc.: *See*—
Kuster, Heinz; and Kuster, Stephan, 5,183,081, Cl. 139-59.000.

Astronautics Corporation of America: *See*—
Barclay, John A.; Waynert, Joseph A.; DeGregoria, Anthony J.; Johnson, Joseph W.; and Claybaker, Peter J., 5,182,914, Cl. 62-3.100.

AT&T Bell Laboratories: *See*—
Black, Edward P.; and Smith, Douglas C., 5,184,115, Cl. 340-708.000.
Farwell, Charles Y.; Hearn, Michel L.; Heidebrecht, Richard M.; Ho, Kelvin K.; and Spencer, Douglas A., 5,184,347, Cl. 370-94.100.
Fouad, Fakhry A., 5,184,280, Cl. 361-361.000.
Kraus, Joseph S.; Lanzerotti, Louis J.; and Medford, Lester V., 5,184,311, Cl. 364-554.010.
Sahni, Paramdeep S., 5,184,345, Cl. 370-54.000.

Atlas Die, Inc.: *See*—
Love, Marc C., 5,183,202, Cl. 229-123.000.

Atlas Pacific Engineering Company: *See*—
Meissner, Konrad E., 5,182,983, Cl. 99-486.000.

Atsugi Unisia Corporation: *See*—
Morita, Shoji; Yamada, Yoshihiko; and Hara, Seinosuke, 5,183,015, Cl. 123-90.160.

Aubel, John A.; Devall, Jeffrey E.; Gimby, David R.; and Shipp, Philip A., to Borg-Warner Automotive Electronic & Mechanical Systems Corporation. Refueling vapor recovery system. 5,183,087, Cl. 141-59.000.

Audi A.G.: *See*—
Stege, Jurgen, 5,183,170, Cl. 220-86.200.

Ausimont S.r.l.: *See*—
Brunetta, Fabio; and Pantini, Giovanni, 5,183,589, Cl. 252-308.000.

Austin, R. Russell, to Viratec Thin Films, Inc. Solar control properties in low emissivity coatings. 5,183,700, Cl. 428-216.000.

Auto-Stamp Institute Inc.: *See*—
Ichikawa, Kiyomichi, 5,183,249, Cl. 271-186.000.

Automated Pipeline Instruments Incorporated: *See*—
Bailey, Kenneth M.; Mitchener, Rex L.; Wehking, Timothy J.; and Reith, Craig P., 5,182,940, Cl. 73-36.000.

Auweter, Helmut: *See*—
Schwab, Ekkehard; Veitch, Ronald J.; and Auweter, Helmut, 5,183,709, Cl. 428-404.000.

Avery Dennison Corporation: *See*—
Bernard, Margaret M., 5,183,459, Cl. 602-52.000.
Bernard, Margaret M., 5,183,841, Cl. 524-272.000.

Awai, Takashi: *See*—
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.

Ayabe, Kazuhiko, to Suzuki Motor Corp. Mounting structure for lower arm bracket. 5,183,286, Cl. 280-688.000.

Ayers, Laura J.: *See*—
Snyder, Thomas S.; Gass, William R.; Worcester, Samuel A.; Ayers, Laura J.; and Boris, Gregory F., 5,183,541, Cl. 204-105.00R.

Ayukawa, Akitsu; and Onishi, Shigeo, to Sharp Kabushiki Kaisha. Semiconductor device. 5,183,770, Cl. 437-41.000.

Azuma, Ichiro: *See*—
Saiki, Ikuo; Nishi, Norio; Azuma, Ichiro; and Tokura, Seiichi, 5,183,804, Cl. 514-12.000.

B. F. Goodrich Company, The: *See*—
Boo, H. Khim; Mittendorf, Donald H.; and Sell, Walter A., 5,183,212, Cl. 241-17.000.

Baas, Hendrik A. Wind turbine. 5,183,383, Cl. 416-9.000.

Baba, Fumiaki: *See*—
Kodai, Shojiro; Ochi, Katsunori; and Baba, Fumiaki, 5,184,209, Cl. 257-679.000.

Baba, Masahiko; and Ohtsuna, Hiroshi, to Shin-Etsu Handotai Company, Limited. Method of automatic control of growing neck portion of a single crystal by the CZ method. 5,183,528, Cl. 156-601.000.

Baba, Mitushige: *See*—
Kitagawa, Sadao; and Baba, Mitushige, 5,183,856, Cl. 525-282.000.

Babcock & Wilcox Company, The: *See*—
Sanders, John M.; and Harwig, Dennis D., 5,183,989, Cl. 219-121.140.

Babin, James E.: *See*—
Bryant, David R.; Babin, James E.; Nicholson, James C.; and Weintritt, Donald J., Jr., 5,183,943, Cl. 568-454.000.

Bacon, James: *See*—
Menahem, Israel; and Bacon, James, 5,182,961, Cl. 74-471.0XY.

Bacon, John L.; and Bacon, Jonathan M. Exercise machine. 5,183,452, Cl. 482-97.000.

Bacon, Jonathan M.: *See*—
Bacon, John L.; and Bacon, Jonathan M., 5,183,452, Cl. 482-97.000.

Bae, Yl-Sung: *See*—
Lee, Bang-Wan; and Bae, Yl-Sung, 5,184,061, Cl. 323-265.000.
Baehr, Richard R., Jr.: *See*—
Scher, Herbert I.; Ungar, Israel S.; and Baehr, Richard R., Jr., 5,183,600, Cl. 264-26.000.
Baer, Mark; and Crevling, R. Lent, Jr., to Shop Vac Corporation. Structure for coupling field windings to motor brushes. 5,184,041, Cl. 310-239.000.
Bagley, Edward B.: *See*—
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Bailey, Kenneth M.; Mitchener, Rex L.; Wehking, Timothy J.; and Reith, Craig P., to Automated Pipeline Instruments Incorporated. Flash point testing apparatus and method. 5,182,940, Cl. 73-36.000.
Bailey, Ted E.: *See*—
Daiber, Paul C.; Greenwood, Anthony P.; and Bailey, Ted E., 5,183,342, Cl. 384-475.000.
Bain, Ronald: *See*—
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor L.; Greenwood, Brian; Bain, Ronald; and Weston, John, 5,183,536, Cl. 162-57.000.
Bair, Keith A.: *See*—
Wood, Michael R.; Bair, Keith A.; Chen, Fu; and Vasconcellos, Stephen R., 5,183,576, Cl. 210-734.000.
Baird, William E. Garage door opening device. 5,184,132, Cl. 341-176.000.
Bak, Johannes A.: *See*—
Nordstrom, Immo R.; and Bak, Johannes A., 5,183,305, Cl. 294-81.200.
Baker Hughes Incorporated: *See*—
Roof, Glenn L.; and Kremer, Lawrence N., 5,183,560, Cl. 208-236.000.
Baker, Richard H.: *See*—
Pearson, Alan L.; and Baker, Richard H., 5,183,319, Cl. 312-196.000.
Ball, Kenneth A.: *See*—
Ortolano, Ralph J.; Ball, Kenneth A.; and Bowman, Gary, 5,183,244, Cl. 269-43.000.
Band, David M.; and Penman, David G., to Surgicraft Limited. Low resistance electrical pick-up and manufacture thereof. 5,183,043, Cl. 128-642.000.
Baratte, Herve; de Souza, Joel P.; and Sadana, Devendra K., to International Business Machines Corporation. Method for internal gettering of oxygen in III-V compound semiconductors. 5,183,767, Cl. 437-11.000.
Barber, Thomas D., to Schlumberger Technology Corporation. Method and apparatus for correcting data developed from a well tool disposed at a dip angle in a wellbore to eliminate the effects of the dip angle on the data. 5,184,079, Cl. 324-339.000.
Barclay, John A.; Waynert, Joseph A.; DeGregoria, Anthony J.; Johnson, Joseph W.; and Claybaker, Peter J., to Astronautics Corporation of America. Rotary dipole active magnetic regenerative refrigerator. 5,182,914, Cl. 62-3.100.
Bardsley, Harold B., to Spencer Wright Industries, Inc. Tufting machine yarn feed roller assembly. 5,182,997, Cl. 112-80.730.
Barker, Philip P., to Niagara Mohawk Power Corporation. Lightning detecting and recording system. 5,184,215, Cl. 358-93.000.
Barnette, Charles J., to Kent Adhesive Products, Inc. Dust cover laminate for books. 5,183,295, Cl. 281-29.000.
Baroid Technology, Inc.: *See*—
Leaney, Peter A.; and Smith, Robert J., 5,183,113, Cl. 166-316.000.
Baron, Greg. Electrical field display/signal device. 5,184,113, Cl. 340-635.000.
Barozzini, Claude: *See*—
Rishel, Michael; Powers, Larry; and Barozzini, Claude, 5,183,330, Cl. 362-372.000.
Barrett, Dana G.: *See*—
Raymond, Marvin L.; Barrett, Dana G.; and Greene, Phillip B., 5,183,010, Cl. 119-172.000.
Barrick, Michael D.: *See*—
Connolly, Jerome J.; Barrick, Michael D.; D'Agostino, William L.; Thomas, Gerald F.; and Williams, Thomas W., 5,184,141, Cl. 343-705.000.
Barth, Christiane: *See*—
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Barth, Frederic. Dental cleansing device and interdental floss for such a device. 5,183,064, Cl. 132-323.000.
Barth, Gerald D., to Illinois Tool Works Inc. Rotary fastener with anti-strip-out nibs. 5,183,359, Cl. 411-188.000.
Bartoli, Andrew: *See*—
Patuszynski, Duane R.; O'Callaghan, John S.; and Bartoli, Andrew, 5,182,991, Cl. 101-216.000.
Barton, Bruce G., Jr., to Thunderline Corporation. Extendable wall sleeves. 5,182,885, Cl. 52-98.000.
Bartsch, Marlies: *See*—
Fidelak, Michael; and Bartsch, Marlies, 5,182,947, Cl. 73-304.00C.
Bartur, Meir, to Solid State Devices, Inc. Special geometry Schottky diode. 5,184,198, Cl. 257-471.000.
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Barzu, Octavien: *See*—
Danchin, Antoine; Glaser, Philippe; Krin, Evelyne; Barzu, Octavien; Ladant, Daniel; and Ullmann, Agnes, 5,183,745, Cl. 435-69.100.
BASF Aktiengesellschaft: *See*—
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El-Hefnawi, Sobhy; Shah, Shailesh C.; and Wasyliw, Basil, 5,183,847, Cl. 525-54.440.
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BASF Lacke & Farben AG: *See*—
Gross, Lutz-Werner; Poth, Ulrich; Hille, Dieter; and Weidemeier, Klaus, 5,183,835, Cl. 523-402.000.
Basic Measuring Instruments: *See*—
McEachern, Alexander; Nicholson, Jamie; and Waterman, Craig S., 5,184,066, Cl. 324-158.00R.
Basile, Vincent L., II: *See*—
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Bassi, Dario; and Palau, Joseph, to Etablissements Staubli-Verdol. Shed forming device for griffe frames. 5,183,080, Cl. 139-55.100.
Bastin, Jeffrey R.: *See*—
Logan, James D.; and Bastin, Jeffrey R., 5,183,110, Cl. 166-278.000.
Bastin-Logan Water Services, Inc.: *See*—
Logan, James D.; and Bastin, Jeffrey R., 5,183,110, Cl. 166-278.000.
Bate, Frederick D., to Elmwood Packaging Machinery Ltd. Packaging method and apparatus. 5,182,894, Cl. 53-399.000.
Bateman, Colin N.; Clark, Peter L.; and Carter, William G., to National Research Development Corporation. Building elements and joints therefor. 5,182,886, Cl. 52-125.600.
Baten, Robert A.: *See*—
Vicknair, Bruce A.; and Baten, Robert A., 5,184,064, Cl. 324-156.000.
Bates, Joseph H.: *See*—
Crawford, Jack T.; Eisenach, Kathleen D.; Cave, M. Donald; and Bates, Joseph H., 5,183,737, Cl. 435-6.000.
Batistoni, Michel, to Framatome. Removable platform for working inside a casing of a pressurizer of a pressurized-water nuclear reactor. 5,183,625, Cl. 376-260.000.
Battelle Memorial Institute: *See*—
Treat, Russell L.; Gee, Glendon W.; and Whyatt, Greg A., 5,183,355, Cl. 405-128.000.
Batts, Inc.: *See*—
Garrison, Judd F.; and Blanchard, Russell O., 5,183,191, Cl. 223-96.000.
Baudin, Gilles, to L'Oreal. Control value for a container containing a fluid under gaseous pressure and container provided with a value of this kind. 5,183,189, Cl. 222-397.000.
Bauer, Friedrich: *See*—
Saur, Roland; Bauer, Friedrich; and Rothenpieler, Joachim, 5,183,012, Cl. 123-41.080.
Bauer, Fritz U.: *See*—
Gorlich, Karl J.; Bauer, Fritz U.; and Konetzka, Joerg, 5,183,834, Cl. 523-105.000.
Baujat, Jacques; and Chevereau, Gerard, to Framatome. Nuclear reactor internals with cluster guides. 5,183,628, Cl. 376-353.000.
Baumann, Hans, to Grob & Co. Aktiengesellschaft. Frame stave for a heddle frame. 5,183,082, Cl. 139-92.000.
Baxter, David E.: *See*—
Brown, Robert L.; Baxter, David E.; and England, Todd A., 5,183,509, Cl. 118-696.000.
Brown, Robert L.; and Baxter, David E., 5,183,605, Cl. 264-40.500.
Baxter, Douglas P.: *See*—
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Asmussen, Erik; Munksgaard, Erik C.; Muller, Michael; Podszun, Wolfgang; and Winkel, Jens, 5,183,832, Cl. 522-84.000.
Jager, Horst, 5,183,881, Cl. 534-732.000.
Jansen, Johannes R.; and Littmann, Martin, 5,183,939, Cl. 564-302.000.
Kopp, Richard; Grogler, Gerhard; and Hess, Heinrich, 5,183,876, Cl. 528-59.000.
Lindner, Christian; and Eichenauer, Herbert, 5,183,850, Cl. 525-73.000.
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,183,932, Cl. 560-330.000.
Wagner, Klaus; Hanssler, Gerd; and Brandes, Wilhelm, 5,183,898, Cl. 548-178.000.
Weider, Richard; and Scholl, Thomas, 5,183,926, Cl. 560-76.000.
Bazzano, Gail S. Combinations of retinoids and minoxidil-type compounds for hair growth. 5,183,817, Cl. 514-256.000.

Beach, Kirk W.; Phillips, David J.; and Kansky, John, to University of Washington, Board of Regents of the. Ultrasonic plethysmograph. 5,183,046, Cl. 128-661.070.
Beall, George H.; Gadkaree, Kishor P.; Grandi, Thomas P.; and Quinn, Candace J. Polymer membranes for separation process. 5,183,607, Cl. 264-41.000.
Beaufils, Stephen C.; and Latella, Alfonso. Two piece projectile. 5,183,963, Cl. 102-515.000.
Bechu, Jean-Pierre, to Caoutchouc Manufacture et Plastiques S.A. Motor vehicle windshield washer system. 5,183,099, Cl. 165-41.000.
Becker, Eberhard; Schulte, Franz; Sprung, Hartwig; Staggl, Ronald; and Stoeber, Manfred, to Mannesmann AG. Guiding a robot in an array. 5,183,377, Cl. 414-751.000.
Becton, Dickinson and Company: *See*—
Capaccio, Paul R., 5,183,469, Cl. 604-192.000.
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Daniels, Steven D.; Bedzyk, Mark D.; Brahm, Roger S.; and Olexy, Anthony M., 5,184,153, Cl. 346-108.000.
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Hawkins, Larry S.; and Beese, Ulrich, 5,183,180, Cl. 220-908.000.
Behe, Roger: *See*—
Devillers, Yves; Neveu, Frederic; Behe, Roger; and Ramat, Pierre, 5,184,145, Cl. 343-840.000.
Behr GmbH & Co.: *See*—
Armbruster, Horst, 5,182,856, Cl. 29-890.039.
Behr-Industrieanlagen GmbH & Co.: *See*—
Schweiker, Werner; and Leininger, Volker, 5,184,051, Cl. 318-568.000.
Behr-Thomson-Dehnstoffregler GmbH & Co.: *See*—
Saur, Roland; Bauer, Friedrich; and Rothenpieler, Joachim, 5,183,012, Cl. 123-41.080.
Behringwerke Aktiengesellschaft: *See*—
Kapmeyer, Wolfgang, 5,183,766, Cl. 436-533.000.
Bekele, Solomon, to W. R. Grace & Co.-Conn. Forming web for lining a rigid container. 5,183,706, Cl. 428-349.000.
Beldock, Donald T.; and Craig, Paul P., to Beldock, Donald T. Battery having reserve cell and three or more terminals. 5,183,712, Cl. 429-9.000.
Bell, Cynthia S., to Eastman Kodak Company. Photographic system with off-the-film exposure metering. 5,184,174, Cl. 354-480.000.
Bell & Howell Document Management Products Company: *See*—
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Bellemin, Robert: *See*—
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Beloit Technologies, Inc.: *See*—
Hergert, Richard E.; Hergert, Richard R.; Neill, Eugene B.; Pantaleo, Scott B.; Roerig, Arnold J.; Rogers, Thomas D.; Shands, Jay A.; and Takeguchi, Noriaki, 5,183,537, Cl. 162-216.000.
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Belokin, Paul, Jr.; Belokin, Martin P.; and Belokin, Norman P., 5,183,166, Cl. 211-149.000.
Belokin, Norman P.: *See*—
Belokin, Paul, Jr.; Belokin, Martin P.; and Belokin, Norman P., 5,183,166, Cl. 211-149.000.
Belokin, Paul, Jr.; Belokin, Martin P.; and Belokin, Norman P. Foldable shelf display. 5,183,166, Cl. 211-149.000.
Benecke, Wolfgang, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Micromechanical manipulator. 5,182,910, Cl. 60-529.000.
Benjamin, Wesley: *See*—
Hallerstrom, Robert; Durgin, Kirby; and Benjamin, Wesley, 5,183,299, Cl. 285-47.000.
Benn, James A., to Curtis Manufacturing Company, Inc. Cross-flow filtration system and method for filtering a solvent-particulate waste stream. 5,183,572, Cl. 210-650.000.
Berg, Ralph O.; Lang, Fred J., Jr.; and Kupka, Dennis B., to Eastman Kodak Company. Adjustable valve stem apparatus for valve gated injection molding devices. 5,183,069, Cl. 137-15.000.
Berge, Richard H., Jr.; and Larsen, Mark A., to New Morning Windows, Inc. Door frame cladding apparatus. 5,182,880, Cl. 49-504.000.
Bergelin, Risto: *See*—
Lehtomaki, Ilkka; Karinen, Pertti; Bergelin, Risto; and Myllymaki, Olavi, 5,183,677, Cl. 426-436.000.
Berger, Johann; and Berger, Josef, to Berger, Johann. Belt strap for safety belts. 5,183,703, Cl. 428-292.000.
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Berger, Johann; and Berger, Josef, 5,183,703, Cl. 428-292.000.
Bergman, Robert G.: *See*—
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Bergot, B. John, to Applied Biosystems, Inc. Method for chromatographic separation of synthetic phosphorothioate oligonucleotides. 5,183,885, Cl. 536-25.410.
Bergquist, Mark A.: *See*—
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Bernard, Margaret M., to Avery Dennison Corporation. Emulsion pressure-sensitive adhesive polymers in bandage and medical tape constructions. 5,183,459, Cl. 602-52.000.
Bernard, Margaret M., to Avery Dennison Corporation. Removable pressure-sensitive adhesives for recyclable substrates. 5,183,841, Cl. 524-272.000.
Bernardon, Jean-Michel: *See*—
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Berry, Robert R.: *See*—
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Besendorfer, Herman; Stritzke, Gunter; and Haditsch, Franz, to Institut Dr. Friedrich Forster Pruferatebau. Eddy-current defect test instrument with multiple test probes and one distance probe. 5,184,070, Cl. 324-225.000.
Better Living Products: *See*—
Comstock, Roger D.; Tischner, Ryan K.; and Pearce, Wayne E., 5,183,182, Cl. 222-129.000.
Betts, David A.: *See*—
Adams, James W.; Loving, Louis S.; Betts, David A.; Donnelly, David P.; and Nunley, Alvin, III, 5,184,330, Cl. 367-111.000.
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Forester, David R., 5,183,554, Cl. 208-48.0AA.
Forester, David R.; and Roling, Paul V., 5,183,555, Cl. 208-48.0AA.
Vasconcellos, Stephen R.; Boyce, P. Douglas; and Smith, Larry P., 5,183,575, Cl. 210-724.000.
Wood, Michael R.; Bair, Keith A.; Chen, Fu; and Vasconcellos, Stephen R., 5,183,576, Cl. 210-734.000.
Beuhler, Allyson J.: *See*—
Fjare, Douglas E.; Beuhler, Allyson J.; and Navar, Cynthia A., 5,183,534, Cl. 156-668.000.
Bianchi, Mauro, to Mauro Bianchi S.A. Suspension process and apparatus of the type having different stiffnesses with provision to smooth the change from one stiffness to another. 5,183,285, Cl. 280-670.000.
Bielat, Richard A.; and Drain, Kieran F., to Ciba-Geigy Corporation. Radiation curable composition with high temperature oil resistance. 5,183,831, Cl. 522-33.000.
Bielfeldt, Friedrich B., to Maschinenfabrik J. Dieffenbacher GmbH & Co. Method for realigning steel bands with respect to a longitudinal axis of a continuously working press. 5,182,986, Cl. 100-41.000.
Bilak, Ronald E.: *See*—
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Bilge, Umit; Jurczyszyn, Christopher E.; and Jenuwine, William C., to General Motors Corporation. Laser welding method. 5,183,992, Cl. 219-121.640.
Bills, Gerald F.; Hensens, Otto D.; Koupal, Lawrence; Lingham, Russell B.; Ondeyka, John G.; and Zink, Deborah L., to Merck & Co., Inc. Antiviral agent. 5,183,826, Cl. 514-411.000.
Bills, Maria L. Container device and method for making same. 5,183,199, Cl. 229-23.00A.
Bilodeau, Richard R. Weaponry signal apparatus. 5,183,951, Cl. 42-1.010.
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Birkholz, Ronald B.; and Glad, Mark D., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive composition having high shear strength. 5,183,705, Cl. 428-343.000.
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Biss, Russell B.: *See*—
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Bitton, Mary K. Children's toy and bath soap assembly. 5,183,429, Cl. 446-73.000.
Black, David D.; and Vering, Anthony W., to Chicago Rawhide Manufacturing Co. Unitized grit seal with removable thrust bumper. 5,183,269, Cl. 277-37.000.
Black & Decker Inc.: *See*—
Wheeler, Dale K., 5,182,848, Cl. 29-596.000.
Black, Edward P.; and Smith, Douglas C., to AT&T Bell Laboratories. Touch-screen arrangement. 5,184,115, Cl. 340-708.000.
Black, James W. Non-linear propulsion and energy conversion system. 5,182,958, Cl. 74-84.00R.
Black, Michael; and Kupershmidt, Vladimir, to Reliant Laser Corporation. Glasses with color-switchable, multi-layered lenses. 5,184,156, Cl. 351-158.000.
Black, Robert E.: *See*—
DiMarco, Bernard; Black, Robert E.; and Cella, Stephen D., 5,184,099, Cl. 335-16.000.
Blake, William R.: *See*—
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Blake, William S.: *See*—
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Blanchard, Russell O.: *See*—
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Blaszkiewicz, Peter: *See*—
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Blenk, Michael H.; Diemer, Russell B., Jr.; and Hager, John P., to Du Pont de Nemours, E. I., and Company. Copper speiss as a co-additive in refining crude lead bullion. 5,183,496, Cl. 75-702.000.

Blenk, Michael H.; Diemer, Russell B., Jr.; and Hager, John P., to Du Pont de Nemours, E. I., and Company. Iron and a copper speiss as co-additives in refining crude lead bullion. 5,183,497, Cl. 75-702.000.

Blick, Mark: *See*—
Lee, Jin S.; and Blick, Mark, 5,183,805, Cl. 514-13.000.

Blin, Philippe, to Hutchinson S.A. Heat and fire resistant protective covering for hoses, cables and the like. 5,183,079, Cl. 138-110.000.

Blom, Jan, to Hollandache Beton Groep Nov. Sports floor. 5,183,438, Cl. 472-92.000.

Bloom, Terry; and Ernsberger, Craig, to CTS Corporation. Conductive corners for surge survival. 5,184,108, Cl. 338-195.000.

Blumer, Hans. Method of, and apparatus for, detecting the position of a marking or separating element in a stack of substantially flat products. 5,183,247, Cl. 270-95.000.

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Lee, Jin S.; and Blick, Mark, 5,183,805, Cl. 514-13.000.
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Weldon, William F.; Woodson, Herbert H.; and Long, Glen C., 5,183,957, Cl. 89-8.000.

Boart International, Limited: *See*—
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Bock, Martin: *See*—
Tenbrink, Detlef; Bock, Martin; Heymann, Kurt; and Rimkus, Martin, 5,183,553, Cl. 205-162.000.

Bodziak, Douglas P.; Grovender, Steven L.; Hunder, Ray A.; Molenda, Robert P.; and Roth, Steven P., to Minnesota Mining and Manufacturing. Hexagonal pad. 5,183,297, Cl. 283-67.000.

Boehm, Valentine R., Jr.: *See*—
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Boehringer Mannheim GmbH: *See*—
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Boeing Company, The: *See*—
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Boekelheide, Karl: *See*—
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Bogut, Henry A.: *See*—
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Bohmer, Rainer; Bruhn, Rainer; Rienhardt, Hans-Peter; and Walther, Bernd, to SWF Auto-Electric GmbH. Drive unit, in particular for a windshield wiper system on a motor vehicle. 5,182,957, Cl. 74-42.000.

Bohrn, Walter J.; Diffenbaugh, Kimberly S.; Garman, Shelly N.; and Khanpara, Jatin C., to Armstrong World Industries, Inc. Highly microporous 2:1 layered silicate materials. 5,183,704, Cl. 428-305.500.

Bokerman, Gary N.: *See*—
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Bollensen, Eric G.: *See*—
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Boller, Peter K., to Lily Cups, Inc. Drink through container lid. 5,183,172, Cl. 220-270.000.

Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., to SGS-Thomson Microelectronics, Inc. Method for holding a strip of conductive lead frames. 5,182,851, Cl. 29-827.000.

Bonetti, Carla: *See*—
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Toja, Emilio; Bonetti, Carla; Barzaghi, Fernando; and Galliani, Giulio, 5,183,896, Cl. 546-326.000.

Bonne, Andreas; Claar, Klaus; and Schrader, Jurgen, to Mercedes-Benz AG. Fastening for a movable part of a motor vehicle. 5,183,300, Cl. 292-216.000.

Bonnet, Andre ; and Danner, Jean-Pierre. Magnetic control process for transfering energy in a static converter. 5,184,289, Cl. 363-20.000.

Boo, H. Khim; Mittendorf, Donald H.; and Sell, Walter A., to B. F. Goodrich Company, The. Method for separating multilayer plastics into its components. 5,183,212, Cl. 241-17.000.

Bools, William G., to General Electric Company. Cable backshell. 5,183,417, Cl. 439-610.000.

Booze, Janice E. Nursing garment. 5,182,813, Cl. 2-104.000.

Bopp, Stefan, to Mercedes-Benz AG. Air filter device for an internal-combustion engine. 5,183,017, Cl. 123-198.00D.

Borchard, John. Compact self-adjusting weighing system having stable measurement resolution. 5,183,124, Cl. 177-210.0FP.

Borg-Warner Automotive Electronic & Mechanical Systems Corporation: *See*—
Aubel, John A.; Devall, Jeffrey E.; Gimby, David R.; and Shipp, Philip A., 5,183,087, Cl. 141-59.000.

Borg-Warner Automotive Inc.: *See*—
Robbins, Francis B., 5,183,444, Cl. 475-210.000.

Borg-Warner Automotive Transmission & Engine Components Corporation: *See*—
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Borg-Warner Automotive Transmission & Engine Components Corporations: *See*—
Malecha, Gregory J., 5,183,139, Cl. 192-45.000.

Boris, Gregory F.: *See*—
Snyder, Thomas S.; Gass, William R.; Worcester, Samuel A.; Ayers, Laura J.; and Boris, Gregory F., 5,183,541, Cl. 204-105.00R.

Borodic, Gary E., to Associated Synapse Biologics. Controlled administration of chemodenervating pharmaceuticals. 5,183,462, Cl. 604-51.000.

Bory, Barbara H.: *See*—
Lew, Jeanie; and Bory, Barbara H., 5,183,580, Cl. 252-8.600.

Boudot, Daniel, to Pont-A-Mousson S.A. Equipment installation for positioning and clamping foundry molds. 5,183,097, Cl. 164-306.000.

Boughner, Murphy D.; Padilla, Paul J.; and Bowling, Floyd A., to Amerada Hess Corporation. Portable well analyzer. 5,182,946, Cl. 73-151.000.

Boutet, John C.; and Kocher, Thomas E., to Eastman Kodak Company. Diffuse light collector which minimizes streak artifacts. 5,184,013, Cl. 250-236.000.

Bowles, Dale D., Sr.; and Parmley, Charles L. Heated drug box. 5,183,994, Cl. 219-387.000.

Bowling, Floyd A.: *See*—
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Bowman, Gary: *See*—
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Boyce, P. Douglas: *See*—
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Boyd, Dana M., to Mobil Oil Corporation. Bag dispensing system and bag pack. 5,183,158, Cl. 206-554.000.

Boyd, Edward L.; Eley, E. R.; and Puri, Jeewan L., to ABB Power T&D Company, Inc. Internal arc gap for secondary side surge protection and dissipation of a generated arc. 5,184,270, Cl. 361-35.000.

Boyle, Joseph P., to Exxon Research and Engineering Company. Ozone regeneration of platinum, and polymetallic platinum reforming catalysts. 5,183,789, Cl. 502-52.000.

Bradshaw, Dan A.: *See*—
Wiegel, Dave C.; Bradshaw, Dan A.; and Petravicius, Stasys, 5,184,275, Cl. 361-223.000.

Bragger, Barry L., to Aquotech, Inc. Method of cleaning semiconductor wafer and computer disks by purified water treated with electric AC signal. 5,183,512, Cl. 134-1.000.

Brahm, Roger S.: *See*—
Daniels, Steven D.; Bedzyk, Mark D.; Brahm, Roger S.; and Olexy, Anthony M., 5,184,153, Cl. 346-108.000.

Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; De Gamboa, Cristina R. F.; Garcia, Jesus G.; and Berlanga, Jose M. C., to Laboratories Knoll, S.A. Method for treating leukemias using N-(2-dimethylaminoethyl)-3-amino-1,8-naphthalimide for treating leukemias and solid tumors. 5,183,821, Cl. 514-296.000.

Branca, Phillip A.; Hubis, Daniel E.; Mallouk, Robert S.; and Perry, Randal L. Electrolytic cell with composite, porous diaphragm. 5,183,545, Cl. 204-252.000.

Brandau, Egbert; Huschka, Hans; Kadner, Martin; and Schroder, Waldemar, to Nukem GmbH. Method for manufacturing spherical particles out of liquid phase. 5,183,493, Cl. 75-335.000.

Brandell, Bernie. Wrist mounted map holder apparatus. 5,183,193, Cl. 224-219.000.

Brandes, Wilhelm: *See*—
Wagner, Klaus; Hanssler, Gerd; and Brandes, Wilhelm, 5,183,898, Cl. 548-178.000.

Branum, Brian. Goggles having an extrusion-mounted lens. 5,182,817, Cl. 2-439.000.

Brazeway, Incorporated: *See*—
Adams, Michael B., 5,183,105, Cl. 165-140.000.

Breda, Bernard: *See*—
Salerno, Martine S.; Mounier, Remy; and Breda, Bernard, 5,183,588, Cl. 252-312.000.

Bredesen, Scott E.: *See*—
Alvarez, Robert J.; Bredesen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., 5,182,925, Cl. 62-347.000.

Bredif, Didier: *See*—
Abeille, Pierre; and Bredif, Didier, 5,183,219, Cl. 242-68.100.

Brehm, Claude; Dupont, Philippe; and Tardy, Andre , to Alcatel Fibres Optiques. Method of making multi-ferrules having a series of channels with parallel axes. 5,183,489, Cl. 65-4.200.

Bremer, Wolfgang; Knoll, Peter; and Heintz, Frieder, to Robert Bosch GmbH. Method of and arrangement for representing travel guiding information. 5,184,123, Cl. 340-995.000.

Bressel, Burkhard; Meyer, Heinrich; Meyer, Walter; and Gedrat, Klaus, to Schering Aktiengesellschaft. Process for metallization of a noncon-

ductor surface, especially on a circuit board having preexisting copper surfaces. 5,183,552, Cl. 205-158.000.

Briddell, Brian J.: *See*—
Fisher, Dennis K.; and Briddell, Brian J., 5,183,833, Cl. 522-182.000.

Bridgestone Corporation: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.

Briggs, Stuart P., to Shell Internationale Research Maatschappij B.V. Process for preparing diphenyl ethers. 5,183,907, Cl. 549-310.000.

Briggs, Willard S.; and Matula, David W., to Cyrix Corporation. Rectangular array signed digit multiplier. 5,184,318, Cl. 364-754.000.

Bright, Danielle A.: *See*—
Aaronson, Alan M.; and Bright, Danielle A., 5,183,905, Cl. 549-218.000.

Brink, Andrew E.: *See*—
Riffle, Judy S.; Sinai-Zingde, Gurudus D.; and Brink, Andrew E., 5,183,861, Cl. 525-413.000.

Bristol-Myers Squibb Company: *See*—
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,183,808, Cl. 514-33.000.

British Columbia Research Corporation: *See*—
Roberts, Dane R., 5,183,757, Cl. 435-240.490.

British Technology Group Limited: *See*—
Watson, John, 5,184,230, Cl. 359-9.000.

Brittain, Charles: *See*—
Ross, Gilbert B.; and Brittain, Charles, 5,182,842, Cl. 29-240.000.

Brodene, Timothy; Plotner, Michael; and Cramer, Bruce, to FEDCO Automotive Components Co., Inc. Heater cores having exposed surfaces burnished by wet blasting. 5,182,882, Cl. 51-317.000.

Brog, Terrence K.; and Manning, William R., to Cooper Indusries, Inc. Alumina-zirconia ceramic. 5,183,610, Cl. 264-56.000.

Brooks, Dee W.; Stewart, Andrew O.; and Martin, Jonathan G., to Abbott Laboratories. Arylalkylether and arylalkylthioether inhibitors of lipoxygenase enzyme activity. 5,183,818, Cl. 514-231.500.

Brooks, Russell G. Universal collapsible bag support stand. 5,183,226, Cl. 248-97.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Kato, Hiroyuki, 5,183,348, Cl. 400-616.200.
Maruo, Satoshi; Hattori, Chikamasa; and Kameyama, Fumio, 5,184,053, Cl. 318-571.000.

Brouzes, Carole; Ressencourt, Claude; and de Place, Alain, to Alcatel Transmission par Faisceaux Hertziens. Agile microwave filter having at least one ferrite resonator. 5,184,097, Cl. 333-202.000.

Brown, Brent W., to Integrated Systems Engineering, Inc. Solid state color display system and light emitting diode pixels therefor. 5,184,114, Cl. 340-701.000.

Brown, Robert L. Trash receptacle assembly. 5,183,175, Cl. 220-408.000.

Brown, Robert L.; Baxter, David E.; and England, Todd A., to GenCorp Inc. Apparatus for application of a material to an internal surface of items of manufacture. 5,183,509, Cl. 118-696.000.

Brown, Robert L.; and Baxter, David E., to GenCorp Inc. Method for injection into a self-clamping mold. 5,183,605, Cl. 264-40.500.

Brucker, Gerard K.: *See*—
Hojnacki, Robert J.; Pearson, Daniel C.; Brucker, Gerard K.; Gober, Michael J.; and Shaw, Daniel J., Jr., 5,183,159, Cl. 206-583.000.

Bruckner, Raimund; Hintzen, Ullrich; Lee, Steve; Schuler, Andreas; and Wiesel, Martin, to Didier-Werke AG. Shutoff assembly and improved drive rod therefor. 5,183,624, Cl. 266-236.000.

Bruhn, Rainer: *See*—
Bohmer, Rainer; Bruhn, Rainer; Rienhardt, Hans-Peter; and Walther, Bernd, 5,182,957, Cl. 74-42.000.

Brune, Richard; Papiernik, Wolfgang; and Rochholz, Guenter, to Siemens Aktiengesellschaft. Method of regulating the torque response of a multiphase electronically commutated electric motor. 5,184,056, Cl. 318-799.000.

Brunetta, Fabio; and Pantini, Giovanni, to Ausimont S.r.l. Stable emulsions of perfluoropolyethers. 5,183,589, Cl. 252-308.000.

Brunnenkant, Siegfried W. Helicopter icing spray system. 5,182,944, Cl. 73-117.100.

Brunner, Rudolf: *See*—
Kramer, Andreas; Brunner, Rudolf; and Zahir, Abdul-Cader, 5,183,869, Cl. 526-262.000.

Bruno, John. Needle removal/containment and transport apparatus for safe storage and disposal of hypodermic needles/syringe assemblies. 5,183,156, Cl. 206-366.000.

Bryant, David R.; Babin, James E.; Nicholson, James C.; and Weintritt, Donald J., Jr., to Union Carbide Chemicals & Plastics Technology Corporation. Reactivation of hydroformylation catalysts. 5,183,943, Cl. 568-454.000.

Buchmann, Bernd: *See*—
Heindl, Josef; Skuballa, Werner; Buchmann, Bernd; Frohlich, Wolfgang; and Ederdt, Rolalnd, 5,183,925, Cl. 560-61.000.

Buckelew, Jack E. Pavement hole seal covered repair fill. 5,183,353, Cl. 404-69.000.

Buckley, Edward M.: *See*—
Gatts, James D.; Buckley, Edward M.; and Jamieson, John W., 5,183,457, Cl. 600-21.000.

Budde, Volker, to Carl Freudenberg, Firma. Hydraulic valve clearance compensator. 5,183,016, Cl. 123-90.550.

Buehler AG: *See*—
Mueller, Roman, 5,183,161, Cl. 209-467.000.

Bufford, Charles D.; and Gruidel, James M., to Dutton-Lainson Company. Panel construction for bathing tub. 5,182,821, Cl. 4-592.000.

Bull, Brian S.; and Korpman, Ralph A., to Medical Devices Corporation. Optical blood hemostatic analysis apparatus and method. 5,184,188, Cl. 356-39.000.

Bull, S.A.: *See*—
Abdelmouttalib, Najib; and Duflot, Didier, 5,184,348, Cl. 370-95.100.
Gadreau, Jean; and Pascal, Andre, 5,184,103, Cl. 336-84.00C.

Burchill, Gary W.; Gillett, Frank E.; Ramaswamy, Rajan; and Winslow, Peter S. Fish line stripping basket. 5,182,877, Cl. 43-54.100.

Burckhardt, Christoph B., to Kontron Instruments Holdings NV. Doppler flow velocity meter. 5,183,047, Cl. 128-661.090.

Burkat, Alexander, to Walt Disney Company, The. Pressure activated seat belt locking mechanism. 5,182,836, Cl. 24-633.000.

Burke, Robert R.: *See*—
Cragga, Jack L.; and Burke, Robert R., 5,183,975, Cl. 181-202.000.

Burkholder, Richard A.; and Acker, Gregory G., to Sherwood Medical Company. Actuated biopsy cutting needle with removable stylet. 5,183,054, Cl. 128-754.000.

Burks, Lonnie R. Method for cleaning boat hulls. 5,183,000, Cl. 114-222.000.

Burney, Michael. Holographic display imaging process. 5,184,232, Cl. 359-32.000.

Burns, Lee E.: *See*—
Taylor, Raymond L.; Burns, Lee E.; and MacDonald, James C., 5,183,689, Cl. 427-164.000.

Burroughs, Alan C.: *See*—
Johann, Donald F.; and Burroughs, Alan C., 5,184,343, Cl. 369-116.000.

Butler, John L., to Image Acoustics, Inc. Multiport underwater sound transducer. 5,184,332, Cl. 367-162.000.

Buurman, Wim, to Celltech Limited. Antibodies for use in antilymphocyte antibody therapy. 5,183,657, Cl. 424-85.800.

BWG Bergwerk-und Walzwerk Maschinenbau GmbH: *See*—
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 5,182,931, Cl. 72-183.000.

Bybordi, Farhad: *See*—
Day, David R.; and Bybordi, Farhad, 5,184,077, Cl. 324-693.000.

Cain, Earl S., to Tribotech. Semiconductor die packages having lead support frame. 5,184,207, Cl. 257-668.000.

Calabrese, Salvadore J.; Scarton, Henry A.; Murray, S. Frank; Ettles, Christopher M.; Kennedy, Warren C.; Dinc, Saim; Jlidi, Bessem; and Strong, William, to Renselaer Polytechnic Institute; and Steinway Musical Properties, Inc. Piano key covers formed of ivory substitute and pianos having same. 5,183,955, Cl. 84-437.000.

Caldwell, Henry C., to Applied Analytical Industries, Inc. Oral liquid compositions of non-steroidal anti-inflammatory drugs. 5,183,829, Cl. 514-570.000.

Cale, Albert D., Jr.: *See*—
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; and Stauffer, Harold F., Jr., 5,183,902, Cl. 548-950.000.

Callahan, David D.; Reese, Craig; Baxter, Douglas P.; and Murray, Stephen M., to Murray Equipment, Inc. Chemical handling system. 5,183,147, Cl. 198-524.000.

Camaioni, Domenico: *See*—
Lepori, Agostino; and Camaioni, Domenico, 5,183,837, Cl. 524-13.000.

Camp, William P., Jr.: *See*—
Jacobs, William A.; and Camp, William P., Jr., 5,182,840, Cl. 492-24.000.

Campbell, Bryant A., to Abtox, Inc. Circular waveguide plasma microwave sterilizer apparatus. 5,184,046, Cl. 315-111.210.

Campbell, David L.: *See*—
Fung, Jimmy; An, Jiu; Campbell, David L.; and Shyu, Steven, 5,184,129, Cl. 341-144.000.

Camper, Franklin: *See*—
Latchinian, Gerard; Latchinian, Ramy; and Camper, Franklin, 5,183,142, Cl. 194-206.000.

Campoli, Ralph F.; and McGovern, John T., to Olin Corporation. Extended charge cartridge assembly. 5,183,961, Cl. 102-439.000.

Canadian Aging & Rehabilitation Product Development Corporation: *See*—
Roy, Orest Z.; Fulford, Raymond E.; and Legal, Jules O., 5,183,133, Cl. 180-252.000.

Canare Electric Co., Ltd.: *See*—
Yoshimori, Naoki, 5,182,859, Cl. 30-90.600.

Canat, Jean-Noel; and Mortgat, Regis, to Framatome; and Compagnie Generale des Matieres Nucleaires. Additional grid for a nuclear reactor fuel assembly, and assembly comprising an application thereof. 5,183,629, Cl. 376-439.000.

Cannady, John P.: *See*—
Yeh, Li-Tain; Kenney, Malcolm E.; Bokerman, Gary N.; Cannady, John P.; and Marko, Ollie W., 5,183,914, Cl. 556-467.000.

Canon Kabushiki Kaisha: *See*—
Egawa, Akira, 5,184,161, Cl. 354-105.000.
Matsumoto, Shinichi, 5,184,296, Cl. 364-419.000.
Ohishi, Shinji; Akutsu, Kotaro; and Sakai, Toshikazu, 5,184,055, Cl. 318-615.000.
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.
Saika, Toshihiro; Kobayashi, Isao; Kaifu, Noriyuki; and Endo, Tadao, 5,184,007, Cl. 250-208.100.

Suga, Yuko; and Shimomura, Masako, 5,184,148, Cl. 346-1.100.
Takayanagi, Yoshiaki; and Hirabayashi, Hiromitsu, 5,184,178, Cl. 355-202.000.
Terada, Masahiro; Togano, Takeshi; Yamashita, Masataka; Iwaki, Takashi; Mori, Shosei; and Shinjo, Kenji, 5,183,586, Cl. 252-299.610.
Tsuchiya, Keiji, 5,184,339, Cl. 369-44.280.
Ueno, Isamu, 5,184,006, Cl. 250-208.100.
Umetsu, Sachio; and Miura, Toshihiko, 5,182,843, Cl. 29-445.000.
Unno, Yasuyuki; Orii, Seiji; and Yonekawa, Masami, 5,184,176, Cl. 355-52.000.
Yamanobe, Masato, 5,184,200, Cl. 257-53.000.
Yuasa, Satoshi; and Tomida, Yoshinori, 5,183,879, Cl. 528-503.000.

Caoutchouc Manufacture et Plastiques S.A.: *See*—
Bechu, Jean-Pierre, 5,183,099, Cl. 165-41.000.

Capaccio, Paul R., to Becton, Dickinson and Company. Device for the removal and replacement of a needle shield. 5,183,469, Cl. 604-192.000.

Cardiasmenos, Apostle G., to Raytheon Company. Pulse radar and components therefor. 5,184,136, Cl. 342-153.000.

Cardis, Angeline B.; and Shanholtz, Carl E., to Mobil Oil Corporation. Fuel compositions containing reaction products of aromatic triazoles and fatty acids salt as antiwear additives. 5,183,475, Cl. 44-343.000.

Carl Freudenberg, Firma: *See*—
Budde, Volker, 5,183,016, Cl. 123-90.550.

Carlo, Louis D.; and Adkins, Joey B., to Winner, James E. Self-contained anti-theft device for motor vehicles. 5,184,023, Cl. 307-10.300.

Carlsson, Goran; and Hellsten, Martin, to Berol Nobel Stenungsund AB. Ethanol fuel and its use as a diesel fuel. 5,183,476, Cl. 44-445.000.

Carns, Lawrence G.; and Tuot, James, to Nestec S.A. Recovery of aroma gases. 5,182,926, Cl. 62-352.000.

Carpenter, Leslie E., to Dow Corning Corporation. Single and multi-layer coatings containing aluminum nitride. 5,183,684, Cl. 427-574.000.

Carpenter, Peter J., to Trico Products Corporation. Pivot joint. 5,183,352, Cl. 403-79.000.

Carr, Merle E.; Doane, William M.; Wing, Robert E.; and Bagley, Edward B., to United States of America, Agriculture. Starch encapsulation of biologically active agents by a continuous process. 5,183,690, Cl. 427-213.310.

Carrano, James A., to DEC International, Inc. Livestock sorting system having identification sensor and gate mounted exit switch. 5,183,008, Cl. 119-155.000.

Carrier Corporation: *See*—
Eisenhauer, Virgil E., 5,184,063, Cl. 324-86.000.

Carrier, Odie R.; and Pike, Steven C. Sheet-mattress retainer. 5,182,827, Cl. 5-498.000.

Carroll, Jim K., to Caterpillar Inc. Low noise rotating fan and shroud assembly. 5,183,382, Cl. 415-173.600.

Carroll, Stephen F.; and Goff, Dane A., to Xoma Corporation. Hindered linking agents and methods. 5,183,904, Cl. 549-68.000.

Carson, William W.: *See*—
Gilby, Anthony C.; and Carson, William W., 5,184,192, Cl. 356-246.000.

Carter, Charles G.; Jovancicevic, Vladimir; Hartman, Judith A.; and Kreh, Robert P., to W. R. Grace & Co.-Conn. Corrosion inhibitors. 5,183,590, Cl. 252-392.000.

Carter, William G.: *See*—
Bateman, Colin N.; Clark, Peter L.; and Carter, William G., 5,182,886, Cl. 52-125.600.

Case, Richard N., to RCP Enterprises, Inc. Underwater flashlight holder. 5,183,326, Cl. 362-191.000.

Case Western Reserve University: *See*—
Yeh, Li-Tain; Kenney, Malcolm E.; Bokerman, Gary N.; Cannady, John P.; and Marko, Ollie W., 5,183,914, Cl. 556-467.000.

Casio Computer Co., Ltd.: *See*—
Miyashita, Takashi; Miyazawa, Yoshinaga; and Kikuchi, Zenta, 5,184,236, Cl. 359-63.000.

Caspar, Michel, to Montres Breguet S.A. Clock movement. 5,184,333, Cl. 368-28.000.

Cassady, Gregory T.: *See*—
Rowbotham, Ronald H.; and Cassady, Gregory T., 5,183,122, Cl. 175-52.000.

Castiglioni, Giovanni: *See*—
Visani, Francesco; Tavazzani, Carlo; Ajroldi, Giuseppe; and Castiglioni, Giovanni, 5,183,851, Cl. 525-85.000.

Catalytica, Inc.: *See*—
Dalla Betta, Ralph A.; Ezawa, Nobuyasu; Tsurumi, Kazunori; Schlatter, James C.; and Nickolas, Sarento G., 5,183,401, Cl. 431-7.000.

Caterpillar Inc.: *See*—
Carroll, Jim K., 5,183,382, Cl. 415-173.600.
Devier, Lonnie J.; Krone, John J.; Lunzman, Stephen V.; and Marsden, Howard A., 5,182,908, Cl. 60-420.000.
Greer, Robert D., 5,182,980, Cl. 92-5.00R.
Morgan, Denny E., 5,182,979, Cl. 92-5.00R.
Styfhoorn, John, 5,182,988, Cl. 100-98.00R.
Taft, Morris E.; Anderton, Peter W.; and Maguire, Roy L., 5,183,318, Cl. 305-39.000.

Cavanna S.p.A.: *See*—
Francioni, Renzo, 5,183,144, Cl. 198-382.000.

Cave, M. Donald: *See*—
Crawford, Jack T.; Eisenach, Kathleen D.; Cave, M. Donald; and Bates, Joseph H., 5,183,737, Cl. 435-6.000.

CCL Label, Inc.: *See*—
Sanderson, Martin C., 5,183,696, Cl. 428-194.000.

Cebal: *See*—
Rebeyrolle, Michel; and Schneider, Bernard, 5,183,188, Cl. 222-383.000.

Cella, Stephen D.: *See*—
DiMarco, Bernard; Black, Robert E.; and Cella, Stephen D., 5,184,099, Cl. 335-16.000.

Celltech Limited: *See*—
Buurman, Wim, 5,183,657, Cl. 424-85.800.

Cencula, Arthur A. Tow rope bobbin assembly. 5,183,220, Cl. 242-85.100.

Centre International de Recherches Dermatologiques (CIRD): *See*—
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 5,183,889, Cl. 544-174.000.

Cerestar Holding B.V.: *See*—
Koch, Helmut; and Roper, Harald W. W., 5,183,667, Cl. 424-474.000.

Chagnot, Catherine J., to Stirling Technology, Inc. Air to air heat recovery ventilator. 5,183,098, Cl. 165-8.000.

Challberg, Roy C.; and Townsend, Harold E., to General Electric Company. Nuclear reactor with low-level core coolant intake. 5,183,627, Cl. 376-352.000.

Champion, Allan R., to Du Pont de Nemours, E. I., and Company. Method for producing X-ray detectable spandex fibers. 5,183,614, Cl. 264-184.000.

Chan, Alexander: *See*—
Pan, Yuh-Guo; Chan, Alexander; and Hochman, Lana, 5,183,941, Cl. 564-390.000.

Chandraratna, Roshantha A. S., to Allergan, Inc. Acetylenes disubstituted with a heteroaromatic group and a 2-substituted chromanyl, thiochromanyl or 1,2,3,4-tetrahydroquinolinyl group having retinoid-like activity. 5,183,827, Cl. 514-444.000.

Chang, Allen T.: *See*—
Scoggins, Lacey E.; Lee, Fu M.; Chang, Allen T.; and Perkins, Wiley D., 5,183,538, Cl. 203-28.000.

Chary, Henry H., to Allied-Signal Inc. Bevel gear drive arrangement. 5,182,960, Cl. 74-417.000.

Chary, Henry H.; Fitgibbon, Thomas F.; and Gibson, Christopher M., to Allied-Signal Inc. Cargo drive unit with a hysteresis coupling. 5,183,150, Cl. 198-782.000.

Chase, Peter D., to Louisiana-Pacific Corporation. Tongue and groove board product. 5,182,892, Cl. 52-539.000.

Chattha, Mohinder S., to Ford Motor Company. Thermosettable powder compositions of polymaleimide and allyl-functional prepolymer. 5,183,865, Cl. 525-530.000.

Chemetron-Railway Products, Inc.: *See*—
Wechselberger, Emmerich E.; and Frost, Ralph S., 5,183,519, Cl. 148-582.000.

Chen, Chi J.: *See*—
Liu, Ti Y.; Chen, Chi J.; and Chen, Shou H., 5,183,494, Cl. 75-349.000.

Chen, Chi-Tsun: *See*—
Tung, Fu-Ching; Chen, Chi-Tsun; and Lieu, Sheng-Feng, 5,182,898, Cl. 53-570.000.

Chen, Ching-Shi: *See*—
Landry, Christian C.; Kuo, Jause; Chen, Ching-Shi; and Wu, William, 5,183,321, Cl. 312-250.000.

Chen, Chung-Hsuan: *See*—
Allman, Steve L.; Chen, Chung-Hsuan; and Chen, Fang C., 5,184,015, Cl. 250-282.000.

Chen, Evan N., to Warner-Lambert Company. Razor mechanism. 5,182,858, Cl. 30-85.000.

Chen, Fang C.: *See*—
Allman, Steve L.; Chen, Chung-Hsuan; and Chen, Fang C., 5,184,015, Cl. 250-282.000.

Chen, Fu: *See*—
Wood, Michael R.; Bair, Keith A.; Chen, Fu; and Vasconcellos, Stephen R., 5,183,576, Cl. 210-734.000.

Chen, Henry. Electric coupler for a lighted inflatable device. 5,183,329, Cl. 362-352.000.

Chen, Lien-Yan: *See*—
Wong, Henry; Quates, Ronald D.; and Chen, Lien-Yan, 5,183,268, Cl. 277-27.000.

Chen, Ming-Ho. Anti-destruction structure for an automatic vending machine. 5,183,320, Cl. 312-229.000.

Chen, Shou H.: *See*—
Liu, Ti Y.; Chen, Chi J.; and Chen, Shou H., 5,183,494, Cl. 75-349.000.

Chen, Teh-Hsuan: *See*—
Romanet, Robert F.; and Chen, Teh-Hsuan, 5,183,728, Cl. 430-386.000.

Cheng, W. H. Adjustable multi-desk rack. 5,183,167, Cl. 211-187.000.

Chern, Shyh Y.; and Chiang, Wei C. F. Anti-roll device for motor vehicles. 5,182,959, Cl. 74-411.500.

Chevereau, Gerard: *See*—
Baujat, Jacques; and Chevereau, Gerard, 5,183,628, Cl. 376-353.000.

Chiang, Wei C. F.: *See*—
Chern, Shyh Y.; and Chiang, Wei C. F., 5,182,959, Cl. 74-411.500.

Chiao, Jennifer Y.; Flannagan, Stephen; and Feng, Taisheng, to Motorola, Inc. Regulated BiCMOS output buffer. 5,184,033, Cl. 307-446.000.

Chiba, Isamu: *See*—
Hariu, Kenichi; Chiba, Isamu; and Mano, Seiji, 5,184,140, Cl. 342-372.000.

Chicago Rawhide Manufacturing Co.: *See*—
Ackerman, Yuri; and Gutierrez, Joseph A., 5,183,267, Cl. 277-12.000.
Black, David D.; and Vering, Anthony W., 5,183,269, Cl. 277-37.000.

Chichester, Dennis B.: *See*—
Allread, Alan R.; Chichester, Dennis B.; Rogers, Russell L.; and Knowles, Steven M., 5,182,922, Cl. 62-239.000.

Chien, Sze-Foo; and Traverse, Eugene F., to Texaco Inc. Method for determination of average downhole steam quality by measuring the slip ratio between the vapor and liquid phases of steam. 5,182,939, Cl. 73-29.010.

Chihara, Kazunori: *See*—
Yuyama, Junpei; Geng, Qiquan; Chihara, Kazunori; Minami, Hirofumi; and Goto, Eiichi, 5,184,072, Cl. 324-248.000.

Chikusa, Eiji, to Fuji Electric Co., Ltd. Write-data signal compensation apparatus for disk storage. 5,184,256, Cl. 360-65.000.

Chintis, Michael, to Hunter Mining Company. Method of recovering elemental mercury from soils. 5,183,499, Cl. 75-742.000.

Chism, Warren L., to Tektronix, Inc. Twist lock probe tip. 5,184,065, Cl. 324-158.00P.

Chisso Corporation: *See*—
Kitano, Kisei; Ushioda, Makoto; Uchida, Manabu; and Suzuki, Toshiharu, 5,183,587, Cl. 252-299.630.

Chitnis, Girish K.; Herbst, Joseph A.; and Valyocsik, Ernest W., to Mobil Oil Corp. Use of ZSM-57 in catalytic cracking for gasoline octane improvement and co-production of light olefins. 5,183,790, Cl. 502-67.000.

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Cholinski, Edward J., to Epicor Technology, Inc. Apparatus for patch coating printed circuit boards. 5,183,508, Cl. 118-683.000.

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Durand, David; Vieau, David P.; Wei, Tai S.; and Chu, Ang-Ling, 5,183,593, Cl. 252-514.000.

Chu Associates, Inc.: *See*—
Thombs, David M., 5,184,144, Cl. 343-781.00R.

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Bielat, Richard A.; and Drain, Kieran F., 5,183,831, Cl. 522-33.000.
Kramer, Andreas; Brunner, Rudolf; and Zahir, Abdul-Cader, 5,183,869, Cl. 526-262.000.
O'Neil, Robert M.; Phillips, Emyr; and Wasson, Robert C., 5,183,842, Cl. 524-288.000.
Suchy, Milos; Winternitz, Paul; and Zeller, Martin, 5,183,492, Cl. 504-243.000.

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Cipriano, Nickolas A. Wrestling bed. 5,182,824, Cl. 5-2.100.

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Reese, James R., 5,183,074, Cl. 137-488.000.

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Claar, Klaus: *See*—
Bonne, Andreas; Claar, Klaus; and Schrader, Jurgen, 5,183,300, Cl. 292-216.000.

Clairol Incorporated: *See*—
Pan, Yuh-Guo; Chan, Alexander; and Hochman, Lana, 5,183,941, Cl. 564-390.000.

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McMillin, John V.; and Clark, Jay V., 5,184,003, Cl. 235-454.000.

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Bateman, Colin N.; Clark, Peter L.; and Carter, William G., 5,182,886, Cl. 52-125.600.

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Clearman, Jack F.; and Conner, Billy T., to R. J. Reynolds Tobacco Company. Cigarette. 5,183,062, Cl. 131-194.000.

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Porta, Julien; and Clermont, Christian, 5,182,868, Cl. 34-18.000.

Clever, Eric; and Lyons, Ray. Hermaphroditic multiple contact connector. 5,183,409, Cl. 439-291.000.

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Zakheim, Howard; Clinton, Peter M.; Goldschneider, James D.; Kasmer, Christopher A.; Zahn, Markus; and Hoffmeyer, Charles L., 5,183,214, Cl. 241-30.000.

Clorox Company, The: *See*—
Stanislowski, Anna G.; England, J. Bruce; and Ratcliff, Steven D., 5,183,655, Cl. 424-76.600.

Clukey, Stephen W.: *See*—
Ohannes, James R.; Clukey, Stephen W.; Haacke, Ernest D.; and Yarbrough, Roy L., 5,184,034, Cl. 307-473.000.

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Voss, Karl D., 5,182,854, Cl. 29-888.061.

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Taylor, Jeffrey L.; Luckenbach, Roy; Coco, Michael; and Twickler, Carl, 5,183,702, Cl. 428-266.000.

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Denizou, Jean-Pierre, 5,183,626, Cl. 376-327.000.

Cogema-Compagnie Generale des Matieres Nucleaires: *See*—
Foos, Jacques; Lemaire, Marc; Guy, Alain; Guyon, Vincent; Chomel, Rodolphe; Deloge, Andre ; Doutreluigne, Pierre; and Le Roy, Henri, 5,183,645, Cl. 423-8.000.

Cohen, Amir, to Agroteam Consultants Ltd. Drip irrigation emitter. 5,183,208, Cl. 239-542.000.

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Oren, Yoram; Cohen, Haim; and Soffer, Abraham, 5,183,546, Cl. 204-290.00R.

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Cole, Alistair: *See*—
Ronan, Gerard A.; and Cole, Alistair, 5,184,016, Cl. 250-288.000.

Coleman, James P., to Monsanto Company. Peroxygen bleach activators and bleaching compositions. 5,183,584, Cl. 252-186.380.

Colin Electronics Co., Ltd.: *See*—
Kawamura, Norio, 5,183,050, Cl. 128-687.000.

Collet, Erwin; Rathgeber, Roland; and Jerxsen, Udo, to Westfalia Becorit Industrietechnik GmbH. Apparatus for cooling spent anodes of electrolytic melting baths. 5,182,869, Cl. 34-20.000.

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McCoan, Horace C.; and Collier, James V., 5,183,959, Cl. 89-148.000.

Colt's Manufacturing Company Inc.: *See*—
McCoan, Horace C.; and Collier, James V., 5,183,959, Cl. 89-148.000.

Combi Corporation: *See*—
Takahashi, Takehiko; Iwata, Ryuji; and Shimizu, Yuji, 5,183,315, Cl. 297-488.000.

Commissariat a l'Energie Atomique: *See*—
Cruz, Didier, 5,183,370, Cl. 414-416.000.

Commtech International Management Corporation: *See*—
Joseph, Jose P.; and Madou, Marc J., 5,183,549, Cl. 204-415.000.

Compagnie Generale d'Automatisme CGA-HBS: *See*—
Tasca, Jean-Pierre, 5,184,071, Cl. 324-238.000.

Compagnie Generale de Geophysique: *See*—
Regnault, Alain; Cretin, Jacques; and Froidevaux, Pascal, 5,184,329, Cl. 367-23.000.

Compagnie Generale des Matieres Nucleaires: *See*—
Canat, Jean-Noel; and Mortgat, Regis, 5,183,629, Cl. 376-439.000.

Comstock, Roger D.; Tischner, Ryan K.; and Pearce, Wayne E., to Better Living Products. Liquid dispenser for vertical wall mounting. 5,183,182, Cl. 222-129.000.

Concannon, Michael: *See*—
Feldman, Lewis; and Concannon, Michael, 5,183,386, Cl. 416-119.000.

Concorde Tool Corp.: *See*—
MacMillan, Donald M., 5,182,965, Cl. 74-543.000.

Concordia Mfg. Co., Inc.: *See*—
Stuart, Lambert M., 5,182,839, Cl. 28-283.000.

Concrete Technology, Inc.: *See*—
Spinney, Stewart C., 5,183,505, Cl. 106-672.000.

Conner, Billy T.: *See*—
Clearman, Jack F.; and Conner, Billy T., 5,183,062, Cl. 131-194.000.

Connolly, Jerome J.; Barrick, Michael D.; D'Agostino, William L.; Thomas, Gerald F.; and Williams, Thomas W., to Vought Aircraft Company. Structurally-embedded electronics assembly. 5,184,141, Cl. 343-705.000.

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Continental Aktiengesellschaft: *See*—
Peter, Julius; and Weckerle, Gunter, 5,183,640, Cl. 422-135.000.
Contour Roll Company: *See*—
Gutowski, Timothy A., 5,182,985, Cl. 100-35.000.
Cook, Arnold J. Method and apparatus for single die composite production. 5,183,096, Cl. 164-97.000.
Cook, James E.; and Eriksen, O. Harald S. Double acting simplex plunger pump. 5,183,396, Cl. 417-534.000.
Cook, John E., to Siemens Automotive Limited. Multi-slope canister purge solenoid valve. 5,183,022, Cl. 123-520.000.
Cooke, Michael J.; and McGeown, Arthur J., to Electrotech Limited. Workpiece support. 5,183,402, Cl. 432-5.000.
Cooper, David J.: *See*—
Herron, Carlisle M.; and Cooper, David J., 5,183,707, Cl. 428-364.000.
Cooper Indusries, Inc.: *See*—
Brog, Terrence K.; and Manning, William R., 5,183,610, Cl. 264-56.000.
Coors Porcelain Company: *See*—
Readey, Michael J., 5,183,785, Cl. 501-127.000.
Coors Technical Ceramics Company: *See*—
Prosser, Albert C., 5,183,068, Cl. 137-1.000.
Coplin, John F., to Rolls-Royce Business Ventures Limited. Gas turbine engine power unit. 5,182,904, Cl. 60-39.161.
Corey, Paul F., to Miles Inc. Chromogenic dibenzoxazepinone and dibenzothiazepinone enzyme substrates. 5,183,743, Cl. 435-18.000.
Cornax, Dennis, to Rohr, Inc. Interlocking ring fan jet engine support system. 5,183,223, Cl. 244-54.000.
Cornell Research Foundation, Inc.: *See*—
Raj, Rishi; and Sievers, Albert J., 5,183,602, Cl. 252-587.000.
Timoney, John F., 5,183,659, Cl. 424-92.000.
Corning Incorporated: *See*—
Guile, Donald L., 5,183,608, Cl. 264-44.000.
Cornwall, Kenneth R. Firestop device for flammable floor construction. 5,183,070, Cl. 137-75.000.
Corradini, Paolo: *See*—
Guerra, Gaetano; Vitagliano, Vincenzo M.; Corradini, Paolo; and Albizzati, Enrico, 5,183,853, Cl. 525-132.000.
Council, William J.: *See*—
Washburn, Robert D.; Wedeen, Robert S.; McClanahan, Robert F.; Council, William J.; and Lusher, David M., 5,184,288, Cl. 363-4.000.
Cox, Jerry D.; Linz, Raymond E.; Thome, Jeanne M.; Perry, Winfield B.; Hadley, Franklin O., Jr.; and Knobel, Vladimir A., to General Electric Company. Automated spindle slurry system. 5,182,881, Cl. 51-7.000.
Craft, Jack, to Samsung Electronics Co., Ltd. Controlled-gain transistor amplifier without D-C shift or signal phase reversal in load current. 5,184,088, Cl. 330-254.000.
Craggs, Jack L.; and Burke, Robert R., to Siemens Energy & Automation, Inc. Muffler for a cooling system of an electric motor. 5,183,975, Cl. 181-202.000.
Craig, Paul P.: *See*—
Beldock, Donald T.; and Craig, Paul P., 5,183,712, Cl. 429-9.000.
Cramer, Bruce: *See*—
Brodene, Timothy; Plotner, Michael; and Cramer, Bruce, 5,182,882, Cl. 51-317.000.
Crandall, Barry R.: *See*—
Sarian, Grigor; Crandall, Barry R.; and Duncan, Jeff R., 5,183,039, Cl. 128-400.000.
Crawford, Jack T.; Eisenach, Kathleen D.; Cave, M. Donald; and Bates, Joseph H., to University of Arkansas, The Board of Trustees of the. Repetitive DNA sequence specific for mycobacterium tuberculosis to be used for the diagnosis of tuberculosis. 5,183,737, Cl. 435-6.000.
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Crevling, R. Lent, Jr.: *See*—
Baer, Mark; and Crevling, R. Lent, Jr., 5,184,041, Cl. 310-239.000.
Crimmins, Robert A.; and Flasza, Michael D., to D&K Custom Machine Design, Inc. Method and apparatus for feeding sheets. 5,183,242, Cl. 271-14.000.
Cross Company, The: *See*—
Cudini, A. Mario; Roman, Horst; and Drew, Kenneth A., 5,182,974, Cl. 82-124.000.
Crowe, Lawrence E.; and Metzler, Mark W. Converter and inverter support module. 5,184,291, Cl. 363-37.000.
Crutchfield, Marvin M.; and Reuben, Bertie J., to Monsanto Company. Enzyme activated peroxydisulfate bleach composition. 5,183,473, Cl. 8-110.000.
Cruz, Didier, to Commissariat a l'Energie Atomique. Apparatus for placing or storing flat articles in a cassette with intermediate racks. 5,183,370, Cl. 414-416.000.
Cserpan, Imre: *See*—
Simoncsits, Andras; Kalman, Miklos; Kari, Csaba; and Cserpan, Imre, 5,183,748, Cl. 455-91.000.
CTS Corporation: *See*—
Bloom, Terry; and Ernsberger, Craig, 5,184,108, Cl. 338-195.000.
Cucchiara, Alfred L.: *See*—
MacArthur, Duncan W.; Wolf, Michael A.; McAtee, James L.; Unruh, Wesley P.; Cucchiara, Alfred L.; and Huchton, Roger L., 5,184,019, Cl. 250-380.000.
Cuccio, John S., Jr.: *See*—
Alten, Charles J.; Cuccio, John S., Jr.; Kington, Harry L.; and Fontana, James D., 5,183,270, Cl. 277-81.00R.
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Cummins Engine Co., Inc.: *See*—
Vittorio, David A.; and Reedy, Steven W., 5,183,018, Cl. 123-321.000.
Cunningham, Douglas J., to L.A. Rumbold Limited. Two position adjustable passenger arrangement having cam, plunger, and pivoting lever. 5,183,313, Cl. 297-344.000.
Curry, Shawn. Device for compartmentalizing a container. 5,183,228, Cl. 248-100.000.
Curtis Manufacturing Company, Inc.: *See*—
Benn, James A., 5,183,572, Cl. 210-650.000.
Curto, Rick A.: *See*—
Hurtado, Larry; Curto, Rick A.; and Martin, Dallas, 5,183,966, Cl. 474-20.000.
Cuscurida, Michael; and Speranza, George P., to Texaco Chemical Company. Process for preparing primary hydroxyl-containing diols. 5,183,923, Cl. 560-26.000.
Custom Engineered Materials, Inc.: *See*—
Anderson, Lawrence B.; Hammon, Timothy E.; and Frieler, Cliff, 5,183,646, Cl. 423-210.000.
CVD, Inc.: *See*—
Taylor, Raymond L.; Burns, Lee E.; and MacDonald, James C., 5,183,689, Cl. 427-164.000.
Cyr, Dwayne L.; and McCollom, Dale A. Child's sink apparatus. 5,182,822, Cl. 4-625.000.
Cyrix Corporation: *See*—
Briggs, Willard S.; and Matula, David W., 5,184,318, Cl. 364-754.000.
Czerniawski, Benjamin J. Cantilever dental implant guidestent and method. 5,183,414, Cl. 433-76.000.
D&K Custom Machine Design, Inc.: *See*—
Crimmins, Robert A.; and Flasza, Michael D., 5,183,242, Cl. 271-14.000.
D'Agostino, William L.: *See*—
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Dahms, Steven J.: *See*—
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Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Omoto, Kouichi; and Miyazaki, Takeshi, 5,183,742, Cl. 435-14.000.
Daiber, Paul C.; Greenwood, Anthony P.; and Bailey, Ted E., to General Electric Company. Lubricated bearing assembly. 5,183,342, Cl. 384-475.000.
Daido Metal Company Ltd.: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; Yamamoto, Koichi; and Kato, Tohru, 5,183,637, Cl. 420-479.000.
Daifuku, Hideharu: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.
Daili Chemical Company, Limited: *See*—
Nakamatsu, Toshio; Terao, Masanobu; Muneishi, Shigetoshi; Kometani, Norio; and Hayashi, Yoshiaki, 5,183,892, Cl. 546-76.000.
Dainippon Screen Mfg. Co., Ltd.: *See*—
Kuwabara, Akira; and Koyama, Yasufumi, 5,184,313, Cl. 364-561.000.
Daiwa Seiko, Inc.: *See*—
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Dake, Guy M.: *See*—
Aldous, Stephen C.; and Dake, Guy M., 5,183,404, Cl. 439-55.000.
Dalen, Bjoern; Nilsson, Kenth-Ake-Sune; Hoegnelid, Kurt; and Wecke, Liliane, to Siemens Aktiengesellschaft. Inductive motion sensor. 5,183,056, Cl. 128-782.000.
Dalla Betta, Ralph A.; Ezawa, Nobuyasu; Tsurumi, Kazunori; Schlatter, James C.; and Nickolas, Sarento G., to Catalytica, Inc.; and Tanaka Kikinzoku Kogyo KK. Two stage process for combusting fuel mixtures. 5,183,401, Cl. 431-7.000.
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Daniels, Steven D.; Bedzyk, Mark D.; Brahm, Roger S.; and Olexy, Anthony M., to Eastman Kodak Company. Compact laser printer with light tight compartment access. 5,184,153, Cl. 346-108.000.
Danielson, David O.: *See*—
Tury, Edward L.; Kaste, Keith; Johnson, Ross E.; and Danielson, David O., 5,184,017, Cl. 250-343.000.
Danner, Jean-Pierre: *See*—
Bonnet, Andre ; and Danner, Jean-Pierre, 5,184,289, Cl. 363-20.000.
Dara, Paul S., to Raytheon Company. Telephone communication system having an enhanced timing circuit. 5,184,350, Cl. 370-105.300.
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Rutter, Robert E.; and d'Aragona, Frank S., 5,183,769, Cl. 437-31.000.
Darden, Louis R. Plastic bag dispensing system. 5,183,157, Cl. 206-390.000.
Darnell, Charles F.; and Hafez, Mahmoud M., to Exxon Research and Engineering Company. Hollow fiber module built up from concentric cylinders of hollow fibers. 5,183,566, Cl. 210-321.800.

Dassault Aviation: *See*—
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Dataline Technologies GmbH: *See*—
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Datatape Incorporated: *See*—
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Daugherty, Ronald R.; and Petrocy, Richard J., to Mediatronics, Inc. Back-lightable diffusive display sign. 5,184,116, Cl. 340-764.000.

Davenport, Gary F.: *See*—
Monte, Charles; Worthington, Norman A., III; Mandel, Jonathan; and Davenport, Gary F., 5,183,398, Cl. 434-227.000.

Davidson Textron Inc.: *See*—
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Davis, James D.: *See*—
Warren, Bobby G., Jr.; and Davis, James D., 5,183,369, Cl. 414-339.000.

Day, David R.; and Bybordi, Farhad, to G-C Acquisition, Inc. Abrasion-resistant, high pressure dielectric sensors. 5,184,077, Cl. 324-693.000.

Day, Eric W.: *See*—
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Dean, David W., 5,182,845, Cl. 29-469.000.

Dean, David W., to DCN Industries, Inc. Method of making stuffed figure with sculptured soft face. 5,182,845, Cl. 29-469.000.

Dearman, Peter T., to Neotronics Medical Limited. Resuscitator valve. 5,183,037, Cl. 128-204.180.

Debaes, John, to N.V. Michel Van de Wiele. Gripper guide for double-gripper weaving machines. 5,183,083, Cl. 139-449.000.

Debbas, Elie. Apparatus for locating a breast mass. 5,183,463, Cl. 604-98.000.

DEC International, Inc.: *See*—
Carrano, James A., 5,183,008, Cl. 119-155.000.

Decerprit, Jacques: *See*—
Festal, Didier; Nioche, Jean-Yves; Descours, Denis; Bellemin, Robert; and Decerprit, Jacques, 5,183,924, Cl. 560-56.000.

Decious, Gaylon; and Nesler, Clay, to Johnson Service Company. Facility management system with improved return to automatic control. 5,184,122, Cl. 340-870.160.

Deckers, Andreas: *See*—
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Jacobson, Allan J.; Lai, Wen-Yih F.; Matturro, Michael G.; Deckman, Harry W.; McHenry, James A.; Reynolds, Robert P.; and Zhang, Qiyao, 5,183,788, Cl. 502-4.000.

DeCloux, Richard J. Die cast system for control of stair climbing exercise device. 5,183,449, Cl. 482-53.000.

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Lodico, James I.; Coder, David R.; Adams, Lawrence J.; Guthrie, Rebecca A. F.; Andes, Raymond M., Jr.; and Alexander, Philip G., 5,183,487, Cl. 55-289.000.
Viaud, Jean, 5,182,987, Cl. 100-87.000.

Deering, Richard A., to Research Products Corporation. Multi-stage filter frame assembly. 5,183,488, Cl. 55-320.000.

De Gamboa, Cristina R. F.: *See*—
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; De Gamboa, Cristina R. F.; Garcia, Jesus G.; and Berlanga, Jose M. C., 5,183,821, Cl. 514-296.000.

de' Giudici, Angelo, to Feltrifico Vaneto S.p.A. Method and plant for making laps for felts. 5,182,835, Cl. 19-296.000.

Degnan, Thomas F.: *See*—
Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., 5,183,561, Cl. 208-251.00R.

Degnan, Thomas F., Jr.; Keville, Kathleen M.; Landis, Michael E.; Marler, David O.; and Mazzone, Dominick N., to Mobil Oil Corporation. Hydrocracking process using ultra-large pore size catalysts. 5,183,557, Cl. 208-111.000.

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Kirker, Garry W.; Degnan, Thomas F., Jr.; Huss, Albin, Jr.; and Landis, Michael E., 5,183,559, Cl. 208-119.000.

DeGregoria, Anthony J.: *See*—
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Delaney, Henry W., Jr., to Emson Research Inc. Spray dispensing device having a tapered mixing chamber. 5,183,186, Cl. 222-211.000.

Delattre, Jacques; Gouze, Philippe; and Neuvessel, Jacques, to Societe de Fabrication d'Instruments de Mesure (S.F.I.M.). Friction actuator. 5,184,054, Cl. 318-586.000.

Delco Electronics Corporation: *See*—
Kesler, Scott B.; and Gose, Mark W., 5,184,036, Cl. 307-540.000.

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Hogan, Martin A.; Leppek, Kevin G.; and Spadafora, Peter J., 5,184,299, Cl. 364-426.020.

della Valle, Francesco; and Toffano, Gino, to FIDIA S.p.A. Use of monosialoganglioside GM, to prevent the development of tolerance to the analgesic effect of morphine and related drugs. 5,183,807, Cl. 514-25.000.

Delmas, Gilles: *See*—
Hazan, Jean-Pierre; Polaert, Remy; and Delmas, Gilles, 5,183,996, Cl. 219-452.000.

Deloge, Andre : *See*—
Foos, Jacques; Lemaire, Marc; Guy, Alain; Guyon, Vincent; Chomel, Rodolphe; Deloge, Andre ; Doutreluigne, Pierre; and Le Roy, Henri, 5,183,645, Cl. 423-8.000.

De Matthaeis, Sisto L.: *See*—
Ricco, Mario; De Matthaeis, Sisto L.; and Maldera, Domenico, 5,183,209, Cl. 239-585.100.

Demet, George: *See*—
Mukerji, Prosanto K.; Mallen, Russell; Demet, George; and Fuerhaupter, Harry, 5,183,692, Cl. 427-304.000.

Denizou, Jean-Pierre, to Framatome; and Cogema. Control cluster including demountable fuel for a nuclear fuel assembly. 5,183,626, Cl. 376-327.000.

Dennys, Jean-Pierre, to Societe Industrielle d'Equipment Mecanique. Sealing gasket for a control valve. 5,183,273, Cl. 277-170.000.

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Gorlich, Karl J.; Bauer, Fritz U.; and Konetzka, Joerg, 5,183,834, Cl. 523-105.000.

de Place, Alain: *See*—
Brouzes, Carole; Ressencourt, Claude; and de Place, Alain, 5,184,097, Cl. 333-202.000.

Descours, Denis: *See*—
Festal, Didier; Nioche, Jean-Yves; Descours, Denis; Bellemin, Robert; and Decerprit, Jacques, 5,183,924, Cl. 560-56.000.

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Baratte, Herve; de Souza, Joel P.; and Sadana, Devendra K., 5,183,767, Cl. 437-11.000.

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MacLane, Donald B.; Deur, Ted E.; Anderson, Jeffrey J.; Titterington, Donald R.; Oswald, James C.; and Meissner, Richard S., 5,184,147, Cl. 346-1.100.

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Devall, Jeffrey E.: *See*—
Aubel, John A.; Devall, Jeffrey E.; Gimby, David R.; and Shipp, Philip A., 5,183,087, Cl. 141-59.000.

Devier, Lonnie J.; Krone, John J.; Lunzman, Stephen V.; and Marsden, Howard A., to Caterpillar Inc. Control system for integrating a work attachment to a work vehicle. 5,182,908, Cl. 60-420.000.

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Scheeren, Johan W.; Martinus De Bie, Joannes F.; and De Vos, Dirk, 5,183,913, Cl. 556-446.000.

Dewar, John H., to United Technologies Automotive, Inc. Battery terminal connector. 5,183,419, Cl. 439-765.000.

Dhanoa, Daljit S.: *See*—
Greenlee, William J.; Patchett, Arthur A.; Hangauer, David; Walsh, Thomas F.; Fitch, Kenneth J.; Rivero, Ralph A.; and Dhanoa, Daljit S., 5,183,810, Cl. 514-63.000.

D'Heureuse, Walter; Greive, Martin; Heppenstiel, Gerhard; and Kusch, Hans-Jurgen, to Heidelberg Druckmaschinen AG. Sealing device. 5,182,989, Cl. 101-148.000.

Dickman, Calvin H. Electric kaleidoscope. 5,184,249, Cl. 359-616.000.

Dickson, Joseph F., to Quamco, Inc. Seam-free thread rolling dies. 5,182,937, Cl. 72-469.000.

Didier-Werke AG: *See*—
Bruckner, Raimund; Hintzen, Ullrich; Lee, Steve; Schuler, Andreas; and Wiesel, Martin, 5,183,624, Cl. 266-236.000.

Diemer, Russell B., Jr.: *See*—
Blenk, Michael H.; Diemer, Russell B., Jr.; and Hager, John P., 5,183,496, Cl. 75-702.000.
Blenk, Michael H.; Diemer, Russell B., Jr.; and Hager, John P., 5,183,497, Cl. 75-702.000.

Diesse Diagnostica Senese S.R.L.: *See*—
Meiattini, Franco, 5,183,762, Cl. 436-97.000.

Dietl, Rudolf, to J. Strobel & Sohne GmbH & Co. Sewing machine feeder drive and stitch-length adjustment mechanism. 5,182,999, Cl. 112-178.000.

Diffenbaugh, Kimberly S.: *See*—
Bohrn, Walter J.; Diffenbaugh, Kimberly S.; Garman, Shelly N.; and Khanpara, Jatin C., 5,183,704, Cl. 428-305.500.

Different Dimensions, Inc.: *See*—
Zuckerman, Andrew M., 5,183,190, Cl. 223-96.000.

Dighton, Gaylon L.; and Alvarez, David G., to Dow Chemical Company, The. System and method for recovering volatile organic gases emitted from a polyethylene resin product. 5,182,870, Cl. 34-26.000.

Digital Equipment Corporation: *See*—
Fox, Leslie R., 5,184,211, Cl. 257-706.000.
Mallary, Michesl L., 5,184,267, Cl. 360-126.000.
Novotny, Shlomo D., 5,183,104, Cl. 165-104.330.

Samarov, Victor M.; and Arbanas, Zeljko, 5,184,281, Cl. 361-386.000.
Weng, Lih-Jyh, 5,184,125, Cl. 341-59.000.
Westbrook, Scott R., 5,184,210, Cl. 257-664.000.
Dillingham, Edward W.: *See—*
Holland, Douglas K.; and Dillingham, Edward W., 5,183,478, Cl. 48-197.00R.
DiMarco, Bernard; Black, Robert E.; and Cella, Stephen D., to Siemens Energy & Automation, Inc. Circuit breaker with dual movable contacts. 5,184,099, Cl. 335-16.000.
DiNapoli, Antonio; Goff, Gerald L.; and Sikes, Roger A., to Advanced Micro Devices, Inc. Semi-conductor wafer retention clip. 5,183,245, Cl. 269-254.00R.
Dinc, Saim: *See—*
Calabrese, Salvadore J.; Scarton, Henry A.; Murray, S. Frank; Ettles, Christopher M.; Kennedy, Warren C.; Dinc, Saim; Jlidi, Bessem; and Strong, William, 5,183,955, Cl. 84-437.000.
DiNinno, Frank P.: *See—*
Greenlee, Mark L.; Salzmann, Thomas N.; and DiNinno, Frank P., 5,183,887, Cl. 540-364.000.
Dinverno, Daniel. Van-mounted service carts for skilled tradesmen. 5,183,372, Cl. 414-538.000.
D'Iribarne, Benoit; Mairlot, Henri; and Houang, Paul, to Saint-Gobain Recherche. Material for the tempering of glass. 5,183,491, Cl. 65-351.000.
Discordia, Robert: *See—*
Nicolaou, Kyriacos C.; Sorensen, Erik; Hwang, Chan-Kou; Discordia, Robert; Bergman, Robert G.; and Minto, Robert E., 5,183,942, Cl. 568-375.000.
Ditto Sales, Inc: *See—*
Gutgsell, David R., 5,182,996, Cl. 108-64.000.
Doane, William M.: *See—*
Carr, Merle E.; Doane, William M.; Wing, Robert E.; and Bagley, Edward B., 5,183,690, Cl. 427-213.310.
Dr. J. Hansler GmbH: *See—*
Washuttl, Josef; and Viebahn, Renate, 5,183,911, Cl. 554-181.000.
Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Gunther, 5,182,867, Cl. 33-702.000.
Doering, John W. System for automatically inspecting a flat sheet part. 5,184,217, Cl. 358-106.000.
Doki, Masahiko; and Takei, Michiko, to Fujitsu Limited. Method of forming shallow junctions. 5,183,777, Cl. 437-160.000.
Dommer, Armin; and Dommer, Dieter. Device for insertion by welding of a plastic pipe section into a shaped plastic piece. 5,183,524, Cl. 156-423.000.
Dommer, Dieter: *See—*
Dommer, Armin; and Dommer, Dieter, 5,183,524, Cl. 156-423.000.
Donnelly, David P.: *See—*
Adams, James W.; Loving, Louis S.; Betts, David A.; Donnelly, David P.; and Nunley, Alvin, III, 5,184,330, Cl. 367-111.000.
Dorigotti, Luciano: *See—*
Aliverti, Valerio; Dorigotti, Luciano; Fonio, Teodoro; and Pinza, Mario, 5,183,802, Cl. 514-2.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Sasao, Nobuyuki; and Wada, Yukio, 5,183,652, Cl. 423-579.000.
Dosaka, Katsumi: *See—*
Konishi, Yasuhiro; Kumanoya, Masaki; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 5,184,321, Cl. 365-51.000.
Douard, Pierre R., to Fluidelec. Apparatus for transporting light loads by means of self-propelled carriages on rails. 5,183,368, Cl. 414-222.000.
Douglas, James R.: *See—*
Frank, Jimmy L.; Wolfe, John R., Jr.; and Douglas, James R., 5,182,862, Cl. 33-199.00R.
Doutreluigne, Pierre: *See—*
Foos, Jacques; Lemaire, Marc; Guy, Alain; Guyon, Vincent; Chomel, Rodolphe; Deloge, Andre ; Doutreluigne, Pierre; and Le Roy, Henri, 5,183,645, Cl. 423-8.000.
Dover Corporation: *See—*
Taylor, Jeffrey L.; Luckenbach, Roy; Coco, Michael; and Twickler, Carl, 5,183,702, Cl. 428-266.000.
Dow Chemical Company, The: *See—*
Dighton, Gaylon L.; and Alvarez, David G., 5,182,870, Cl. 34-26.000.
Holbrook, Michael T.; Hebert, Lawrence A.; Najmy, Stephen W.; Stine, Ernest F., Jr.; and Hasche, Reimer, 5,183,797, Cl. 502-355.000.
Langhorst, Martin A.; and Henry, Joseph B., 5,183,604, Cl. 264-40.100.
Myers, Harold D., 5,183,920, Cl. 558-277.000.
Nelb, Robert G., II; and Onder, Kemal, 5,183,864, Cl. 525-452.000.
Rand, Cynthia L., 5,183,919, Cl. 558-274.000.
Dow Corning Corporation: *See—*
Carpenter, Leslie E., 5,183,684, Cl. 427-574.000.
Yeh, Li-Tain; Kenney, Malcolm E.; Bokerman, Gary N.; Cannady, John P.; and Marko, Ollie W., 5,183,914, Cl. 556-467.000.
Dow Corning Toray Silicone Co., Ltd.: *See—*
Okawa, Tadashi, 5,183,912, Cl. 556-425.000.
Dowa Mining Co., Ltd.: *See—*
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, 5,183,630, Cl. 419-31.000.
Dowty Electronic Components Limited: *See—*
North, John M., 5,183,715, Cl. 429-192.000.
Doyle, Richard C.; and Rivera, Lester, to Leviton Manufacturing Company, Inc. Shock hazard protection system. 5,184,271, Cl. 361-49.000.
Dragerwerk Aktiengesellschaft: *See—*
Mattiessen, Hans, 5,183,550, Cl. 204-415.000.
Dragicevic, Zoran, to Laycock SA. Process for the extraction or flushing out of a substance from a heterogenous system, and installation for carrying out the process. 5,183,578, Cl. 210-773.000.
Drago, Ronald P., to Spectrum Innovations, Inc. Method for fishing lines in serial conduits. 5,183,237, Cl. 254-134.400.
Drain, Kieran F.: *See—*
Bielat, Richard A.; and Drain, Kieran F., 5,183,831, Cl. 522-33.000.
Draper, A. Allen. Collapsible toy building. 5,183,427, Cl. 446-4.000.
DRD Diluter Corporation: *See—*
Qureshi, Humayun; and Schwartz, Donald, 5,183,765, Cl. 436-180.000.
Drew, Kenneth A.: *See—*
Cudini, A. Mario; Roman, Horst; and Drew, Kenneth A., 5,182,974, Cl. 82-124.000.
Droulon, Georges, to Ets. Cousin Freres. Locking device for rectilinear or circular displacement mechanical jacks. 5,183,236, Cl. 254-95.000.
Dry, Dennis P.: *See—*
Gilchrist, Alan R.; Duran, Edward M.; Dry, Dennis P.; and Berry, Robert R., 5,183,389, Cl. 416-193.00A.
DT Membranfilter Vertriebs GmbH: *See—*
Mohn, Jurgen; and Heine, Wilhelm, 5,183,567, Cl. 210-321.750.
Duane, Diana C.; Zilley, Eric L.; and Jordan, Robert C., to Microelectronics and Computer Technology Corporation; and Minnesota Mining and Manufacturing Company. Copper/epoxy structures. 5,183,972, Cl. 174-251.000.
DuBois, Samuel C., to Wall Colmonoy Corporation. Braze filler metal with enhanced corrosion resistance. 5,183,636, Cl. 420-442.000.
Dubrul, William R.; and Hillsman, Cecily M., to Interventional Thermodynamics, Inc. Radially expandable dilator. 5,183,464, Cl. 128-3.000.
Duflot, Didier: *See—*
Abdelmouttalib, Najib; and Duflot, Didier, 5,184,348, Cl. 370-95.100.
Duggan, Michael D. Baby bottle holder. 5,183,229, Cl. 248-102.000.
Dukes, Michael, to Imperial Chemical Industries PLC. Selective oestrogen therapy for perimenopausal or postmenopausal conditions. 5,183,814, Cl. 514-171.000.
Dumestre, Alex, III, to Navigation Technology Corporation. Underwater release mechanism. 5,184,328, Cl. 367-4.000.
DuMont, Christopher L.: *See—*
Schmoeger, Mary L.; Hagmaier, Charles P., Jr.; Bogdanowicz, Mitchell J.; DuMont, Christopher L.; and Sehlin, Richard C., 5,184,175, Cl. 355-32.000.
Duncan, James E.; and Smiley, Dean H., to Du Pont de Nemours, E. I., and Company. Process of drawing yarn using an oscillating draw assist element. 5,183,620, Cl. 264-290.700.
Duncan, Jeff R.: *See—*
Sarian, Grigor; Crandall, Barry R.; and Duncan, Jeff R., 5,183,039, Cl. 128-400.000.
Dunder, Thomas: *See—*
Platzer, Stephan J. W.; Procter, Arthur E.; and Dunder, Thomas, 5,183,723, Cl. 430-160.000.
Duphar International Research B.V.: *See—*
Van Wijngaarden, Ineke; Hamminga, Derk; and Wouters, Wouter, 5,183,822, Cl. 514-305.000.
Du Pont de Nemours, E. I., and Company: *See—*
Blenk, Michael H.; Diemer, Russell B., Jr.; and Hager, John P., 5,183,496, Cl. 75-702.000.
Blenk, Michael H.; Diemer, Russell B., Jr.; and Hager, John P., 5,183,497, Cl. 75-702.000.
Champion, Allan R., 5,183,614, Cl. 264-184.000.
Duncan, James E.; and Smiley, Dean H., 5,183,620, Cl. 264-290.700.
Figuly, Garret D., 5,183,862, Cl. 525-437.000.
Zakheim, Howard; Clinton, Peter M.; Goldschneider, James D.; Kasmer, Christopher A.; Zahn, Markus; and Hoffmeyer, Charles L., 5,183,214, Cl. 241-30.000.
Dupont, Philippe: *See—*
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Duran, Edward M.: *See—*
Gilchrist, Alan R.; Duran, Edward M.; Dry, Dennis P.; and Berry, Robert R., 5,183,389, Cl. 416-193.00A.
Durand, David; Vieau, David P.; Wei, Tai S.; and Chu, Ang-Ling, to Poly-Flex Circuits, Inc. Electrically conductive cement. 5,183,593, Cl. 252-514.000.
Durgin, Kirby: *See—*
Hallerstrom, Robert; Durgin, Kirby; and Benjamin, Wesley, 5,183,299, Cl. 285-47.000.
Dussault, Douglas G.: *See—*
Sullivan, Michael J.; and Dussault, Douglas G., 5,184,331, Cl. 367-135.000.
Dutton-Lainson Company: *See—*
Bufford, Charles D.; and Gruidel, James M., 5,182,821, Cl. 4-592.000.
Dwyer, Francis G.: *See—*
Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., 5,183,561, Cl. 208-251.00R.
Dwyer Instruments, Inc.: *See—*
Knop, David G., 5,183,983, Cl. 200-81.90M.

Dye, Thomas A., to Texas Instruments Incorporated. Cached random access memory device and system. 5,184,320, Cl. 365-49.000.

Dykes, Norman L.: *See*—
Lauf, Robert J.; Holcombe, Cressie E.; and Dykes, Norman L., 5,184,286, Cl. 361-529.000.

Dyneema V.O.F.: *See*—
Jacobs, Martinus J. N.; and Rutten, Hendrikus J. J., 5,183,701, Cl. 428-229.000.

Dziuk, Jerome J., Jr.: *See*—
Mallow, William A.; and Dziuk, Jerome J., Jr., 5,183,763, Cl. 436-106.000.

E. J. Brooks Co.: *See*—
Lundberg, George A., Jr., 5,183,301, Cl. 292-318.000.

E. R. Squibb & Sons, Inc.: *See*—
Linder, Karen E.; Nunn, Adrian D.; and Ramalingam, Kondarediar, 5,183,653, Cl. 424-1.100.

Eastman Kodak Company: *See*—
Allmendinger, Franz; Ebner, Arno; Ettischer, Helmut; and Straub, Timo, 5,183,195, Cl. 227-29.000.
Bell, Cynthia S., 5,184,174, Cl. 354-480.000.
Berg, Ralph O.; Lang, Fred J., Jr.; and Kupka, Dennis B., 5,183,069, Cl. 137-15.000.
Boutet, John C.; and Kocher, Thomas E., 5,184,013, Cl. 250-236.000.
Daniels, Steven D.; Bedzyk, Mark D.; Brahm, Roger S.; and Olexy, Anthony M., 5,184,153, Cl. 346-108.000.
Foley, Walter D., 5,184,227, Cl. 358-302.000.
Hausa, Raymond G., 5,184,165, Cl. 354-324.000.
Maskasky, Joe E., 5,183,732, Cl. 430-569.000.
May, John W.; and Mukherjee, Anujit, 5,183,717, Cl. 430-97.000.
Mosehauer, Michael; Newell, Catherine D.; and Mauer, Andrew J., 5,184,194, Cl. 355-297.000.
Romanet, Robert F.; and Chen, Teh-Hsuan, 5,183,728, Cl. 430-386.000.
Sarraf, Sanwal P.; Weber, Sharon W.; Gilmour, Hugh S. A.; and Ficcaglia, Linda I., 5,183,798, Cl. 503-227.000.
Schildkraut, Jay S.; Young, Ralph H.; Williams, David J.; and Scozzafava, Michael, 5,184,323, Cl. 365-124.000.
Schleigh, William R.; and Welter, Thomas R., 5,183,894, Cl. 546-273.000.
Schmittou, Eric R.; and Sowinski, Allan F., 5,183,727, Cl. 430-372.000.
Schmoeger, Mary L.; Hagmaier, Charles P., Jr.; Bogdanowicz, Mitchell J.; DuMont, Christopher L.; and Sehlin, Richard C., 5,184,175, Cl. 355-32.000.
Stelter, Eric C.; and Guth, Joseph E., 5,183,964, Cl. 118-653.000.
Wolber, Jack; Lord, Steve; and Froehling, Dieter, 5,183,252, Cl. 271-276.000.

Ebara Corporation: *See*—
Fujiwara, Satoru, 5,182,919, Cl. 62-193.000.

Eberle, Michael J., to Endosonics Corporation. Method and apparatus for removing artifacts from an ultrasonically generated image of a small cavity. 5,183,048, Cl. 128-662.060.

Ebihara, Kazuyuki: *See*—
Nishi, Yuji; Ito, Shigehiro; Kuguchi, Tatsushi; and Ebihara, Kazuyuki, 5,184,221, Cl. 358-167.000.

Ebner, Arno: *See*—
Allmendinger, Franz; Ebner, Arno; Ettischer, Helmut; and Straub, Timo, 5,183,195, Cl. 227-29.000.

ECC International Limited: *See*—
Hassell, Morgan V.; Stephens, Frederick J.; and Edwards, Ernest J., 5,183,691, Cl. 427-286.000.

Eckhardt, Dennis C.: *See*—
Graber, David W.; Eckhardt, Dennis C.; Pawlak, Andrzej M.; and Faist, Bryan L., 5,184,297, Cl. 364-424.050.

Ecopac, L. P.: *See*—
Hutcheson, Jerry D.; and Blake, William S., 5,183,185, Cl. 222-209.000.

Ederdt, Rolalnd: *See*—
Heindl, Josef; Skuballa, Werner; Buchmann, Bernd; Frohlich, Wolfgang; and Ederdt, Rolalnd, 5,183,925, Cl. 560-61.000.

Edgell, James E.; and Jordan, David L., to Hubbell Incorporated. Cantilevered spoke mounting for lighting fixture. 5,183,331, Cl. 362-426.000.

Edwards, Charles O., to GenCorp Inc. Process for the preparation of solventless, low friction, abrasion-resistant coatings for elastomeric substrates. 5,183,613, Cl. 264-171.000.

Edwards, Ernest J.: *See*—
Hassell, Morgan V.; Stephens, Frederick J.; and Edwards, Ernest J., 5,183,691, Cl. 427-286.000.

Edwards, Robert J.; and Luperti, Harry E., to Pitney Bowes Inc. Diverting apparatus and method for in-line inserting equipment. 5,183,246, Cl. 270-45.000.

Egawa, Akira, to Canon Kabushiki Kaisha. Camera with magnetic recording device. 5,184,161, Cl. 354-105.000.

Ehlert, William C.: *See*—
Amberson, James R.; Ehlert, William C.; and Olson, George E., 5,182,883, Cl. 52-73.000.

Ehnholm, Gosta J., to Instrumentarium Corporation. Magnetic resonance imaging coil for applying NMR and ESR pulses. 5,184,076, Cl. 324-318.000.

Eichenauer, Herbert: *See*—
Lindner, Christian; and Eichenauer, Herbert, 5,183,850, Cl. 525-73.000.

Eisenach, Kathleen D.: *See*—
Crawford, Jack T.; Eisenach, Kathleen D.; Cave, M. Donald; and Bates, Joseph H., 5,183,737, Cl. 435-6.000.

Eisenhauer, Virgil E., to Carrier Corporation. Three phase reversal detection system. 5,184,063, Cl. 324-86.000.

Elasis Sistema Ricerca Fiat Nel Mezzogiorno Societa Consortile per Azioni: *See*—
Ricco, Mario; De Matthaeis, Sisto L.; and Maldera, Domenico, 5,183,209, Cl. 239-585.100.

Elbit-ATI, Ltd.: *See*—
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Electrotech Limited: *See*—
Cooke, Michael J.; and McGeown, Arthur J., 5,183,402, Cl. 432-5.000.

Elegant Design Solutions, Inc.: *See*—
McCurry, Patrick W.; Kellogg, James R.; Boekelheide, Karl; Sexton, Kenneth D.; Ellison, George A.; and Hocker, Robert A., 5,184,025, Cl. 307-66.000.

Eley, E. R.: *See*—
Boyd, Edward L.; Eley, E. R.; and Puri, Jeewan L., 5,184,270, Cl. 361-35.000.

ELF Atochem Italia S.r.l.: *See*—
Visani, Francesco; Tavazzani, Carlo; Ajroldi, Giuseppe; and Castiglioni, Giovanni, 5,183,851, Cl. 525-85.000.

Elf Atochem North America, Inc.: *See*—
Forguy, Christian; Goetz, Frederick J.; Graeber, Edward L.; and Lindstrom, Michael J., 5,183,915, Cl. 558-341.000.

Elford, Howard L.: *See*—
van't Riet, Bartholomeus; Elford, Howard L.; and Wampler, Galen L., 5,183,828, Cl. 514-508.000.

El-Hefnawi, Sobhy; Shah, Shailesh C.; and Wasyliw, Basil, to BASF Corporation. Modified carboxylated rosin polyamide/acrylics. 5,183,847, Cl. 525-54.440.

Eli Lilly and Company: *See*—
Weigel, Leland O., 5,183,910, Cl. 549-539.000.

Elicker, Robert W.; and Gorenc, Daniel L., to AMP Incorporated. Grounded electrical connector assembly. 5,183,405, Cl. 439-108.000.

Eller, J. David. Method, system and apparatus for handling substances on or in water. 5,183,579, Cl. 210-776.000.

Ellinger, Sylvester M.; Spillman, William B., Jr.; and Patriquin, Douglas R., to Simmonds Precision Products, Inc. Method and apparatus for shaft torque measurement with temperature compensation. 5,182,953, Cl. 73-862.335.

Ellis, Gordon F., to Boeing Company, The. Distributed built-in test equipment system for digital avionics. 5,184,312, Cl. 364-551.010.

Ellis, Stafford M., to GEC-Marconi Limited. Helmet systems. 5,184,231, Cl. 359-13.000.

Ellison, George A.: *See*—
McCurry, Patrick W.; Kellogg, James R.; Boekelheide, Karl; Sexton, Kenneth D.; Ellison, George A.; and Hocker, Robert A., 5,184,025, Cl. 307-66.000.

Elmer, Neil C.: *See*—
Haun, Robert E.; Elmer, Neil C.; and Lampson, Robin A., 5,183,498, Cl. 75-709.000.

Elmwood Packaging Machinery Ltd.: *See*—
Bate, Frederick D., 5,182,894, Cl. 53-399.000.

Elsasser, A. Frederick; and Korte, Thomas J., to Henkel Corporation. Process for the preparation of substituted furanones. 5,183,908, Cl. 549-322.000.

Emerson Electric Co.: *See*—
O Breartuin, Ciaran S., 5,184,026, Cl. 307-139.000.

Emilsson, Fred S., to SAB Wabco Holdings B.V. Rail vehicle wheel. 5,183,306, Cl. 295-11.000.

Emory University: *See*—
Hunter, Robert L.; and Ragland, William L., 5,183,687, Cl. 424-78.340.

Emson Research Inc.: *See*—
Delaney, Henry W., Jr., 5,183,186, Cl. 222-211.000.

Ency Nova Inc.: *See*—
Pierrat, Michel A., 5,184,260, Cl. 360-92.000.

Endo, Atsushi: *See*—
Tsutsumi, Michinari; Endo, Atsushi; and Yada, Toshio, 5,183,533, Cl. 156-656.000.

Endo, Kenichi: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.

Endo, Kunihisa, to Toko Kabushiki Kaisha. Bobbin for multiple-connected inductor. 5,184,105, Cl. 336-192.000.

Endo, Noboru: *See*—
Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, 5,184,346, Cl. 370-60.000.

Endo, Tadao: *See*—
Saika, Toshihiro; Kobayashi, Isao; Kaifu, Noriyuki; and Endo, Tadao, 5,184,007, Cl. 250-208.100.

Endo, Takayoshi: *See*—
Yamanashi, Makoto; Jinno, Keishi; Watanabe, Tamio; Endo, Takayoshi; and Yagi, Sakai, 5,183,418, Cl. 439-752.000.

Endo, Tunehiro: *See*—
Sakai, Keijiro; Endo, Tunehiro; Kubota, Yuzuru; Ikimi, Takashi; Mutoh, Nobuyoshi; and Honbu, Mitsuyuki, 5,184,057, Cl. 318-803.000.

Endoh, Hiroshi: *See*—
Nakamura, Masanori; Hirakouchi, Hiroshi; Yatsuka, Takeshi; Kadowaki, Nobuo; and Endoh, Hiroshi, 5,183,863, Cl. 525-438.000.

Endosonics Corporation: *See*—
Eberle, Michael J., 5,183,048, Cl. 128-662.060.

Engberg, John: *See*—
Okun, Nathan; and Engberg, John, 5,184,322, Cl. 365-122.000.

England, J. Bruce: *See*—
Stanislowski, Anna G.; England, J. Bruce; and Ratcliff, Steven D., 5,183,655, Cl. 424-76.600.

England, Todd A.: *See*—
Brown, Robert L.; Baxter, David E.; and England, Todd A., 5,183,509, Cl. 118-696.000.

Enokido, Yutaka: *See*—
Mihara, Teruyoshi; Matsushita, Tsutomu; Yao, Kenji; Hoshi, Masakatsu; Enokido, Yutaka; and Hirota, Yukitsugu, 5,184,204, Cl. 357-629.000.

Enomoto, Takayuki: *See*—
Takahashi, Tadashi; Furuya, Katsuhiko; Nakasima, Masaaki; and Enomoto, Takayuki, 5,184,170, Cl. 354-413.000.

Enyedy, Edward A., to Lincoln Electric Company, The. Method and circuit for protecting plasma nozzle. 5,183,990, Cl. 219-121.540.

Epicor Industries, Inc.: *See*—
Heckman, Greg A., 5,183,173, Cl. 220-367.000.

Epicor Technology, Inc.: *See*—
Cholinski, Edward J., 5,183,508, Cl. 118-683.000.

Erdman, Arthur G.; Rekow, Elizabeth D.; Riley, Donald R.; Klamecki, Barney; Zhu, Yang; and Ahn, Jeong-Ho, to University of Minnesota, Regents of the. Automated high-precision fabrication of objects of complex and unique geometry. 5,184,306, Cl. 364-474.050.

Eriksen, O. Harald S.: *See*—
Cook, James E.; and Eriksen, O. Harald S., 5,183,396, Cl. 417-534.000.

Ernsberger, Craig: *See*—
Bloom, Terry; and Ernsberger, Craig, 5,184,108, Cl. 338-195.000.

Erpelding, Michel; and Vandome, Jacques, to Societe Chimique des Charbonnages. Thermoplastic compositions based on grafted rubber and polyester, a process for their manufacture, and articles obtained therefrom. 5,183,840, Cl. 524-228.000.

ESCO Corporation: *See*—
Ottestad, Jack B., 5,183,316, Cl. 299-69.000.

Eshita, Tooru: *See*—
Suzuki, Masaaki; and Eshita, Tooru, 5,182,861, Cl. 33-18.100.

Eskam, Armin: *See*—
Karius, Klaus D.; Eskam, Armin; and Vogt, Karl-Heinz, 5,183,962, Cl. 102-489.000.

Esterbauer, Hermann: *See*—
Wizani, Wolfgang; Esterbauer, Hermann; Steiner, Walter; and Gomes, Joseph, 5,183,753, Cl. 435-201.000.

Estes, Brian P.: *See*—
Stinson, D. Ray; Stinson, Linda D.; Roberts, Brian F.; Dahms, Steven J.; Estes, Brian P.; and Robertson, Tommy H., 5,182,825, Cl. 5-451.000.

Etablissements Staubli-Verdol: *See*—
Bassi, Dario; and Palau, Joseph, 5,183,080, Cl. 139-55.100.

Ethyl Corporation: *See*—
Wiegand, Karl E.; and Hu, Patrick C., 5,183,061, Cl. 128-897.000.

Ets. Cousin Freres: *See*—
Droulon, Georges, 5,183,236, Cl. 254-95.000.

Ettischer, Helmut: *See*—
Allmendinger, Franz; Ebner, Arno; Ettischer, Helmut; and Straub, Timo, 5,183,195, Cl. 227-29.000.

Ettles, Christopher M.: *See*—
Calabrese, Salvadore J.; Scarton, Henry A.; Murray, S. Frank; Ettles, Christopher M.; Kennedy, Warren C.; Dinc, Saim; Jlidi, Bessem; and Strong, William, 5,183,955, Cl. 84-437.000.

Etzkorn, William G.; and Harkreader, Gordon G., to Union Carbide Chemicals & Plastics Technology Corporation. Anhydrous diluent process for the propylene oxidation reaction to acrolein and acrolein oxidation to acrylic acid. 5,183,936, Cl. 562-532.000.

Eustache, Jacques: *See*—
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 5,183,889, Cl. 544-174.000.

EVG Entwicklungs-u Verwertungs-Gesellschaft m.b.H.: *See*—
Ritter, Gerhard; Ritter, Klaus; and Schmidt, Gerhard, 5,182,932, Cl. 72-217.000.

Exergen Corporation: *See*—
Pompei, Francesco, 5,183,337, Cl. 374-2.000.

Exocell, Inc.: *See*—
Cohen, Margo, 5,183,739, Cl. 435-7.210.

Exxon Chemical Patents Inc.: *See*—
Welborn, Howard C., Jr., 5,183,867, Cl. 526-114.000.

Exxon Research and Engineering Company: *See*—
Boyle, Joseph P., 5,183,789, Cl. 502-52.000.
Darnell, Charles F.; and Hafez, Mahmoud M., 5,183,566, Cl. 210-321.800.
Jacobson, Allan J.; Lai, Wen-Yih F.; Matturro, Michael G.; Deckman, Harry W.; McHenry, James A.; Reynolds, Robert P.; and Zhang, Qiyao, 5,183,788, Cl. 502-4.000.
Stibrany, Robert T.; and Gorun, Sergiu M., 5,183,945, Cl. 568-574.000.

Ezawa, Nobuyasu: *See*—
Dalla Betta, Ralph A.; Ezawa, Nobuyasu; Tsurumi, Kazunori; Schlatter, James C.; and Nickolas, Sarento G., 5,183,401, Cl. 431-7.000.

Fabbri, William, to Keene Corporation. Fluorescent light fixture with open ballast housing. 5,183,327, Cl. 362-219.000.

Fabrique Ebel SA: *See*—
Vollert, Alfred, 5,184,334, Cl. 368-319.000.

Faist, Bryan L.: *See*—
Graber, David W.; Eckhardt, Dennis C.; Pawlak, Andrzej M.; and Faist, Bryan L., 5,184,297, Cl. 364-424.050.

Fan, Lai-Duien G.: *See*—
Hwa, Chih M.; Kelly, John A.; Tai, Wun T.; Fan, Lai-Duien G.; Kreh, Robert P.; and Greaves, Brian, 5,183,574, Cl. 210-701.000.

Fang, Lawrence: *See*—
Labovitz, Jeffrey; Guilford, William J.; Fang, Lawrence; and Liang, Yi, 5,183,891, Cl. 544-235.000.

Fanta, David E.; Hamby, Johnnie L.; and Schleicher, Hart E., to All-waste Services, Inc. Encapsulation method for the containment of waste and salvageable products. 5,183,086, Cl. 141-10.000.

Fanuc Ltd.: *See*—
Arai, Takeji, 5,183,991, Cl. 219-121.640.
Aso, Toshiyuki; and Yoda, Shinji, 5,183,987, Cl. 219-69.120.
Ikeda, Yoshiaki, 5,184,052, Cl. 318-569.000.

Fargher, David G. W.: *See*—
Lee, Ching-Pang; Rieck, Harold P., Jr.; Palmer, Nicholas C.; and Fargher, David G. W., 5,183,385, Cl. 416-97.00R.

Farrell, Michael E.: *See*—
Rasmussen, David L.; Farrell, Michael E.; and Ortiz, Pedro R., 5,184,185, Cl. 355-308.000.

Farris, Timothy M.: *See*—
Pelachyk, Richard; Satterlee, Lowell W.; Zuccaro, Dante C.; and Farris, Timothy M., 5,183,302, Cl. 292-336.300.

Farwell, Charles Y.; Hearn, Michel L.; Heidebrecht, Richard M.; Ho, Kelvin K.; and Spencer, Douglas A., to AT&T Bell Laboratories. Adaptive synchronization arrangement. 5,184,347, Cl. 370-94.100.

FEDCO Automotive Components Co., Inc.: *See*—
Brodene, Timothy; Plotner, Michael; and Cramer, Bruce, 5,182,882, Cl. 51-317.000.

Felder, William, to Aerochem Research Laboratories, Inc. Supersonic virtual impactor. 5,183,481, Cl. 55-15.000.

Feldman, Lewis; and Concannon, Michael. Vertical axis sail bladed wind turbine. 5,183,386, Cl. 416-119.000.

Feltrifico Vaneto S.p.A.: *See*—
de' Giudici, Angelo, 5,182,835, Cl. 19-296.000.

Feng, Taisheng: *See*—
Chiao, Jennifer Y.; Flannagan, Stephen; and Feng, Taisheng, 5,184,033, Cl. 307-446.000.

Fenton, Gary L.; Sill, Gerald A.; Ingram, Robert S.; and Jimenez, James G., to Stoughton Trailers, Inc. Container stacking apparatus. 5,183,375, Cl. 410-35.000.

Fernandez, Jose M.: *See*—
Patino, Joseph; Fernandez, Jose M.; and Bogut, Henry A., 5,184,059, Cl. 320-15.000.

Ferrari, Harry M.: *See*—
Snyder, Thomas S.; Jackovitz, John F.; and Ferrari, Harry M., 5,183,548, Cl. 204-299.00R.

Festal, Didier; Nioche, Jean-Yves; Descours, Denis; Bellemin, Robert; and Decerprit, Jacques, to Lipha, Lyonnaise Industrielle Pharmaceutique. Derivatives of benzocycloalkenyldihydroxyalkanoic acids, processes of preparation and medications containing them. 5,183,924, Cl. 560-56.000.

Fetterhoff, Gary W.; and Blake, William R., to Fetterhoff, Gary W.; and Park, James M. Apparatus for forming at least one fold line pattern in a rigid plastic material. 5,183,672, Cl. 425-304.000.

Fey, Peter: *See*—
Angerbauer, Rolf; Fey, Peter; Hubach, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; and Schmidt, Delf, 5,183,897, Cl. 546-330.000.

Ficcaglia, Linda I.: *See*—
Sarraf, Sanwal P.; Weber, Sharon W.; Gilmour, Hugh S. A.; and Ficcaglia, Linda I., 5,183,798, Cl. 503-227.000.

Fichtel & Sachs AG: *See*—
Leiter, Berndt, 5,182,962, Cl. 74-473.00R.

Fidelak, Michael; and Bartsch, Marlies, to HL Planartechnik GmbH. Electric measuring arrangement for determining the level of an electrically conductive liquid. 5,182,947, Cl. 73-304.00C.

FIDIA S.p.A.: *See*—
della Valle, Francesco; and Toffano, Gino, 5,183,807, Cl. 514-25.000.

Fiedler, Robert R., to Isco, Inc. Valve pump. 5,183,391, Cl. 417-118.000.

Field, John D. Swimming flipper. 5,183,424, Cl. 441-64.000.

Figuly, Garret D., to Du Pont de Nemours, E. I., and Company. Hyperbranched polyesters. 5,183,862, Cl. 525-437.000.

Filterwerk Mann & Hummel GmbH: *See*—
Karls, Dieter, 5,182,871, Cl. 34-54.000.

Findeisen, Kurt: *See*—
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,183,932, Cl. 560-330.000.

FIS - Fabbrica Italiana Sintetici S.p.A.: *See*—
Rizzi, Amleto; and Marchioro, Gaetano, 5,183,922, Cl. 560-7.000.

Fisher, Dennis K.; and Briddell, Brian J., to Adco Products Inc. Ultraviolet radiation photopolymerization of acrylic ester pressure sensitive adhesive formulation. 5,183,833, Cl. 522-182.000.

Fisher, Thorsten E.: *See*—
Saari, Walfred S.; Rodan, Gideon A.; Fisher, Thorsten E.; and Anderson, Paul S., 5,183,815, Cl. 514-172.000.

Fitch, Kenneth J.: *See*—
Greenlee, William J.; Patchett, Arthur A.; Hangauer, David; Walsh, Thomas F.; Fitch, Kenneth J.; Rivero, Ralph A.; and Dhanoa, Daljit S., 5,183,810, Cl. 514-63.000.
Fitgibbon, Thomas F.: *See*—
Chary, Henry H.; Fitgibbon, Thomas F.; and Gibson, Christopher M., 5,183,150, Cl. 198-782.000.
Fjare, Douglas E.; Beuhler, Allyson J.; and Navar, Cynthia A., to Amoco Corporation. Wet-etch process and composition. 5,183,534, Cl. 156-668.000.
Flanders, Tammy L.: *See*—
Niho, Yoji G.; Day, Eric W.; and Flanders, Tammy L., 5,184,134, Cl. 342-25.000.
Flannagan, Stephen: *See*—
Chiao, Jennifer Y.; Flannagan, Stephen; and Feng, Taisheng, 5,184,033, Cl. 307-446.000.
Flasza, Michael D.: *See*—
Crimmins, Robert A.; and Flasza, Michael D., 5,183,242, Cl. 271-14.000.
Fleege, Dennis W.: *See*—
Jordan, Scott C.; Wolf, Robert L.; Fleege, Dennis W.; and Sharp, Jeffrey O., 5,184,278, Cl. 361-346.000.
Fleming Group, The: *See*—
Hesse, Bradley J.; and Gentile, Philip J., 5,184,058, Cl. 320-4.000.
Fleming, William T., to Walter Kidde Aerospace, Inc. Variable pressure regulator for extended fire-extinguishing system. 5,183,116, Cl. 169-43.000.
Flemming, Elvin-Jensen. Bulk Containers. 5,183,178, Cl. 220-650.000.
Flim, Duane D.: *See*—
Alvarez, Robert J.; Bredesen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., 5,182,925, Cl. 62-347.000.
Flower, Wallace C.: *See*—
Siwek, C. Kenneth; Flower, Wallace C.; and Garn, Gene D., 5,183,137, Cl. 188-381.000.
Floyd, Burton R., Jr., to Floyd and Gilbert Company, The. Circle marking and cutting guide template. 5,183,373, Cl. 409-179.000.
Floyd and Gilbert Company, The: *See*—
Floyd, Burton R., Jr., 5,183,373, Cl. 409-179.000.
Fluidelec: *See*—
Douard, Pierre R., 5,183,368, Cl. 414-222.000.
FMC Corporation: *See*—
Wong, Henry; Quates, Ronald D.; and Ghen, Lien-Yan, 5,183,268, Cl. 277-27.000.
Focke & Co.: *See*—
Focke, Heinz; and Liedtke, Kurt, 5,183,380, Cl. 414-795.800.
Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Apparatus including an endless pocket conveyor for automatically transferring stacks of packaging blanks to a blank magazine of a packaging machine. 5,183,380, Cl. 414-795.800.
Foley, Walter D., to Eastman Kodak Company. Photographic printer with index print generation. 5,184,227, Cl. 358-302.000.
Folkman, Judah: *See*—
Weisz, Paul B.; Shing, Yuen W.; and Folkman, Judah, 5,183,809, Cl. 514-58.000.
Folks, Thomas M.: *See*—
Kindt, Thomas J.; Kulaga, Henrietta; and Folks, Thomas M., 5,183,949, Cl. 800-2.000.
Fonio, Teodoro: *See*—
Aliverti, Valerio; Dorigotti, Luciano; Fonio, Teodoro; and Pinza, Mario, 5,183,802, Cl. 514-2.000.
Fontana, James D.: *See*—
Alten, Charles J.; Cuccio, John S., Jr.; Kington, Harry L.; and Fontana, James D., 5,183,270, Cl. 277-81.00R.
Foos, Jacques; Lemaire, Marc; Guy, Alain; Guyon, Vincent; Chomel, Rodolphe; Deloge, Andre ; Doutreluigne, Pierre; and Le Roy, Henri, to Cogema-Compagnie Generale des Matieres Nucleaires. Method for recovering with the aid of a crown compound plutonium (IV) present in solutions, such as aqueous effluents, concentrated solutions of fission products and concentrated solutions of plutonium. 5,183,645, Cl. 423-8.000.
Foote, Wayne E.; Mui, Paul K.; and Sleger, Roger R., to Hewlett-Packard Company. Magnetic head suspension assembly in a disk drive. 5,184,265, Cl. 360-106.000.
Ford Motor Company: *See*—
Chattha, Mohinder S., 5,183,865, Cl. 525-530.000.
Hamel, Gregory R., 5,184,283, Cl. 361-395.000.
Potter, Timothy J.; Tamor, Michael A.; and Wu, Ching-Hsong, 5,183,529, Cl. 156-613.000.
Forester, David R., to Betz Laboratories, Inc. Method for controlling fouling deposit formation in a liquid hydrocarbonaceous medium. 5,183,554, Cl. 208-48.0AA.
Forester, David R.; and Roling, Paul V., to Betz Laboratories, Inc. Method for controlling fouling deposit formation in a liquid hydrocarbonaceous medium. 5,183,555, Cl. 208-48.0AA.
Forguy, Christian; Goetz, Frederick J.; Graeber, Edward L.; and Lindstrom, Michael J., to Elf Atochem North America, Inc. Catalyst and process for the production of 3-cyano-3,5,5-trialkylcyclohexanone. 5,183,915, Cl. 558-341.000.
Fort Lock Corporation: *See*—
Myers, Gary L., 5,182,929, Cl. 70-337.000.
Forward, Robert L. Statite: spacecraft that utilizes sight pressure and method of use. 5,183,225, Cl. 244-168.000.
Foto Fantasy, Inc.: *See*—
Massarsky, Yefim, 5,184,160, Cl. 354-76.000.
Fouad, Fakhry A., to AT&T Bell Laboratories. Power rectifier with flexible stacked sheave bus bar for high current carrying connections. 5,184,280, Cl. 361-361.000.
Foulkes, Albert E., Jr.; and McHugh, John M. Expandable fixture pin for machine tools. 5,183,358, Cl. 411-59.000.
Fox Bay Industries, Inc.: *See*—
Walker, Wayne E.; and Walker, Grant A., 5,183,230, Cl. 248-118.000.
Fox, Leslie R., to Digital Equipment Corporation. Apparatus for packaging and cooling integrated circuit chips. 5,184,211, Cl. 257-706.000.
Foxconn International, Inc.: *See*—
Yin, Mercury, 5,183,421, Cl. 439-857.000.
Framatome: *See*—
Batistoni, Michel, 5,183,625, Cl. 376-260.000.
Baujat, Jacques; and Chevereau, Gerard, 5,183,628, Cl. 376-353.000.
Canat, Jean-Noel; and Mortgat, Regis, 5,183,629, Cl. 376-439.000.
Denizou, Jean-Pierre, 5,183,626, Cl. 376-327.000.
Francioni, Renzo, to Cavanna S.p.A. Apparatus for orienting products on a conveyor line particularly for automatic packaging machines and method relating thereto. 5,183,144, Cl. 198-382.000.
Frank, Jimmy L.; Wolfe, John R., Jr.; and Douglas, James R., to Gagemaker, Inc. Indicating thread gage. 5,182,862, Cl. 33-199.00R.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 5,182,995, Cl. 104-2.000.
Fraser, David W.: *See*—
Robar, Sheldon C.; Fraser, David W.; and Wiley, Bernard A., 5,182,913, Cl. 60-671.000.
Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Benecke, Wolfgang, 5,182,910, Cl. 60-529.000.
Frayer, Robert W., Jr.: *See*—
Adler, Jonathan M.; Monahan, Russell E.; and Frayer, Robert W., Jr., 5,184,069, Cl. 324-207.220.
Fredericks, W. David: *See*—
Rhodes, Richard D., Jr.; and Fredericks, W. David, 5,183,693, Cl. 428-34.100.
Freeman, Gary M.: *See*—
Freeman, Mary J.; and Freeman, Gary M., 5,183,761, Cl. 436-8.000.
Freeman, Lewis G. Lifting eyebolt assembly. 5,183,360, Cl. 411-400.000.
Freeman, Mary J.; and Freeman, Gary M. Method of making calibration solution for verifying calibration and linearity of vertical photometers. 5,183,761, Cl. 436-8.000.
Frei, Bruno: *See*—
Ramos, Gerado; Ghisalba, Oreste; Schar, Hans-Peter; Frei, Bruno; Maienfisch, Peter; and O'Sullivan, Anthony C., 5,183,749, Cl. 435-119.000.
French, John B., to Sumimoto Electric Interconnect Products, Inc. Printing apparatus and method for printing on an elongated member such as a tube. 5,184,152, Cl. 346-76.0PH.
Frenkel, Jeffry T.; and Anderson, Brent C., to Hughes Missile Systems Company. Method of leak detection using a releasable surface film. 5,182,941, Cl. 73-40.000.
Frey, Bruno: *See*—
Kaluza, Klaus; Frey, Bruno; and Jarsch, Michael, 5,183,747, Cl. 435-91.000.
Frieler, Cliff: *See*—
Anderson, Lawrence B.; Hammon, Timothy E.; and Frieler, Cliff, 5,183,646, Cl. 423-210.000.
Frigoscandia Food Process Systems AB: *See*—
Wierman, Michael J.; and Olsson, Lennart F., 5,183,149, Cl. 198-778.000.
Froehling, Dieter: *See*—
Wolber, Jack; Lord, Steve; and Froehling, Dieter, 5,183,252, Cl. 271-276.000.
Frohlich, Wolfgang: *See*—
Heindl, Josef; Skuballa, Werner; Buchmann, Bernd; Frohlich, Wolfgang; and Ederdt, Rolalnd, 5,183,925, Cl. 560-61.000.
Froidevaux, Pascal: *See*—
Regnault, Alain; Cretin, Jacques; and Froidevaux, Pascal, 5,184,329, Cl. 367-23.000.
Frost, Ralph S.: *See*—
Wechselberger, Emmerich E.; and Frost, Ralph S., 5,183,519, Cl. 148-582.000.
Fuerhaupter, Harry: *See*—
Mukerji, Prosanto K.; Mallen, Russell; Demet, George; and Fuerhaupter, Harry, 5,183,692, Cl. 427-304.000.
Fuji Electric Co., Ltd.: *See*—
Chikusa, Eiji, 5,184,256, Cl. 360-65.000.
Oyama, Jun; and Uchida, Naoshi, 5,184,100, Cl. 335-16.000.
Fuji Electrochemical Co., Ltd.: *See*—
Yasumura, Takaaki; Kiyomiya, Teruo; Mizuno, Yasutoshi; and Matsui, Kazuo, 5,183,517, Cl. 148-303.000.
Fuji Photo Film Co., Ltd.: *See*—
Arai, Fuminori; and Katsuyama, Harumi, 5,183,741, Cl. 435-14.000.
Inagaki, Yoshio; and Ikeda, Tadashi, 5,183,733, Cl. 430-583.000.
Kato, Eiichi; and Ishii, Kazuo, 5,183,720, Cl. 430-96.000.
Kato, Eiichi; and Ishii, Kazuo, 5,183,721, Cl. 430-96.000.
Komatsu, Kazunori; and Tomaru, Mikio, 5,183,686, Cl. 427-549.000.
Kose, Junichi; Sugiyama, Akira; Yamada, Minoru; and Nozaki, Ryoei, 5,184,164, Cl. 354-298.000.
Mizuno, Masato; and Oishi, Kengo, 5,184,268, Cl. 360-132.000.
Naito, Hideki; Yokoyama, Shigeki; and Tsukahara, Jiro, 5,183,729, Cl. 430-385.000.

Nakata, Tomohiro; and Mizuta, Akira, 5,184,197, Cl. 356-426.000.
Nishitani, Yasuhiro, 5,184,169, Cl. 354-412.000.
Saito, Osamu; Ito, Kenji; Moronaga, Kenji; and Watanabe, Mikio, 5,184,229, Cl. 358-427.000.
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, 5,184,166, Cl. 354-400.000.
Takahashi, Osamu; and Furutachi, Nobuo, 5,183,731, Cl. 430-551.000.
Tatsumi, Setsuji, 5,184,214, Cl. 358-75.000.
Torisawa, Nobuyuki, 5,183,241, Cl. 271-12.000.

Fuji Xerox Co., Ltd.: *See—*
Yagi, Shigeru; Fukuda, Yuzuru; Higashi, Taketoshi; and Yokoi, Masaki, 5,183,719, Cl. 430-66.000.

Fujii, Isao; Ajiki, Yoshio; Ishida, Yoichi; and Matsuura, Hiromi, to Honda Giken Kogyo Kabushiki Kaisha. Method of controlling the supply of fuel in hydrogen-fueled engine. 5,183,011, Cl. 123-1.00A.

Fujii, Makoto: *See—*
Shizuno, Hisamitsu; Kisi, Hirosi; Saito, Hirosi; and Fujii, Makoto, 5,184,277, Cl. 361-321.000.

Fujii, Nobuhiko: *See—*
Kurimoto, Yukuo; Fujii, Nobuhiko; Kohno, Mitunori; and Umebara, Takao, 5,183,135, Cl. 186-61.000.

Fujii, Toshiro; Ikeda, Hayato; Katoh, Ryo; and Inukai, Hitoshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash plate type compressor with a central inlet passage. 5,183,394, Cl. 417-269.000.

Fujii, Yoshihisa; Suzuki, Akira; Furukawa, Katsuki; and Shigeta, Mitsuhiro, to Sharp Kabushiki Kaisha. Silicon carbide semiconductor device. 5,184,199, Cl. 257-77.000.

Fujimoto, Kazushi: *See—*
Yoshida, Makoto; Yamada, Hironori; Takahashi, Nobuo; and Fujimoto, Kazushi, 5,183,708, Cl. 428-373.000.

Fujimoto, Mineyuki, to Aichi Sharyo Co. Ltd. Mobile vehicular apparatus with aerial cabin. 5,183,168, Cl. 212-232.000.

Fujimoto, Shinichiro: *See—*
Yamasaki, Yoshikiyo; and Fujimoto, Shinichiro, 5,183,034, Cl. 128-36.000.

Fujimura, Koh: *See—*
Sano, Kazuyoshi; Fujimura, Koh; Suzuki, Takumi; and Tsutsui, Takashi, 5,184,239, Cl. 359-80.000.

Fujimura, Setsuo: *See—*
Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 5,183,516, Cl. 148-302.000.

Fujio, Ryota: *See—*
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.

Fujisaki, Koji: *See—*
Miwa, Takao; Ikeda, Takayoshi; Numata, Shunichi; Fujisaki, Koji; and Shimanoki, Hisae, 5,183,838, Cl. 524-109.000.

Fujisawa, Kazuhiro: *See—*
Miyamoto, Yoshiaki; Sasaki, Teruo; Fujisawa, Kazuhiro; and Kato, Seinosuke, 5,182,888, Cl. 52-167.0DF.

Fujisawa, Mutsumi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Power transfer device having center differential gear for four-wheel drive vehicle. 5,183,132, Cl. 180-247.000.

Fujishima, Kazuyasu: *See—*
Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,184,327, Cl. 365-201.000.

Fujitsu Limited: *See—*
Doki, Masahiko; and Takei, Michiko, 5,183,777, Cl. 437-160.000.
Kimura, Takafumi, 5,183,510, Cl. 118-719.000.
Kobayashi, Yasushi; and Kogure, Seiji, 5,182,853, Cl. 29-841.000.
Takasaki, Kanetake, 5,183,778, Cl. 437-132.000.

Fujiwara, Satoru, to Ebara Corporation. Oil recovery system for closed type centrifugal refrigerating machine. 5,182,919, Cl. 62-193.000.

Fukakusa, Masaharu; and Tomiyasu, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Loading method and drive unit for a floating magnetic head for loading the magnetic head while preventing contact between the magnetic head and a magnetic disk. 5,184,263, Cl. 360-103.000.

Fukase, Katsuya: *See—*
Wada, Norio; Fukase, Katsuya; and Uchida, Hirofumi, 5,183,711, Cl. 428-596.000.

Fukaya, Yasushi, to Kabushiki Kaisha Okuma Tekkosho. Apparatus for generating numerical control information for machining parts. 5,184,294, Cl. 364-191.000.

Fukuchi, Masakazu: *See—*
Haneda, Satoshi; Morita, Shizuo; Fukuchi, Masakazu; and Matsuo, Shunji, 5,184,187, Cl. 355-326.000.

Fukuda, Yuzuru: *See—*
Yagi, Shigeru; Fukuda, Yuzuru; Higashi, Taketoshi; and Yokoi, Masaki, 5,183,719, Cl. 430-66.000.

Fukui, Wataru; Iwata, Toshio; Ohashi, Yutaka; and Ikeuchi, Masayuki, to Mitsubishi Denki K.K. Cylinder identification apparatus. 5,182,943, Cl. 73-116.000.

Fukunaga, Masao: *See—*
Kogure, Makoto; Sase, Akira; and Fukunaga, Masao, 5,184,121, Cl. 340-870.110.

Fukuoka, Kazuhiro; Kiyohara, Keiki; Konishi, Tadayuki; Miyatake, Isao; and Hamamoto, Masaji, to Kosaku & Co., Ltd. Electroless plating bath composition and method for production thereof. 5,183,500, Cl. 106-1.220.

Fukushima, Hiroshi; Motonaga, Akira; Suda, Eriko; Nakajima, Mikito; Takeshita, Katsuyoshi; and Kutsukake, Yusuke, to Mitsubishi Rayon Co., Ltd; and Seiko Epson Corporation. Composition for plastic lenses. 5,183,870, Cl. 526-273.000.

Fukushima, Yoshihisa: *See—*
Hamasaka, Hiroshi; Satoh, Isao; and Fukushima, Yoshihisa, 5,184,341, Cl. 369-54.000.

Fukuyama, Yuichi: *See—*
Imaseki, Takashi; Tamura, Minoru; Iwata, Toru; and Fukuyama, Yuichi, 5,184,298, Cl. 364-424.050.

Fukuzumi, Tatsuo: *See—*
Abe, Tsuyoshi; Umezawa, Nobumasa; Fukuzumi, Tatsuo; Uchibori, Katsuyuki; Ozaki, Junji; and Motomura, Hiroharu, 5,183,634, Cl. 420-110.000.

Fulford, Raymond E.: *See—*
Roy, Orest Z.; Fulford, Raymond E.; and Legal, Jules O., 5,183,133, Cl. 180-252.000.

Fung, Jimmy; An, Jiu; Campbell, David L.; and Shyu, Steven, to Advanced Micro Devices, Inc. Switchable DAC with current surge protection. 5,184,129, Cl. 341-144.000.

Fung, Kuan-Zong: *See—*
Virkar, Anil V.; and Fung, Kuan-Zong, 5,183,801, Cl. 501-152.000.

Furuhashi, Takeshi: *See—*
Okuma, Shigeru; Furuhashi, Takeshi; Ikejima, Hiroyuki; and Ishii, Toshiaki, 5,183,980, Cl. 187-112.000.

Furukawa Electric Co., Ltd., The: *See—*
Mikami, Toshihiro; Kohmura, Yukio; Ishida, Yoshinori; and Nogami, Akira, 5,183,490, Cl. 65-144.000.

Furukawa, Katsuki: *See—*
Fujii, Yoshihisa; Suzuki, Akira; Furukawa, Katsuki; and Shigeta, Mitsuhiro, 5,184,199, Cl. 257-77.000.

Furuta, Tatsuo: *See—*
Yonekubo, Shuji; Kitahara, Tsuyoshi; Furuta, Tatsuo; Katakura, Takahiro; and Serizawa, Naomi, 5,184,155, Cl. 346-140.00R.

Furutachi, Nobuo: *See—*
Takahashi, Osamu; and Furutachi, Nobuo, 5,183,731, Cl. 430-551.000.

Furuya, Katsuhiko; and Takahashi, Tadashi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Light source apparatus for endoscope. 5,184,159, Cl. 354-62.000.

Furuya, Katsuhiko: *See—*
Takahashi, Tadashi; Furuya, Katsuhiko; Nakasima, Masaaki; and Enomoto, Takayuki, 5,184,170, Cl. 354-413.000.

Furuya, Takeo: *See—*
Harada, Naoto; Sekine, Shuji; Furuya, Takeo; and Yoshioka, Nobuo, 5,184,050, Cl. 318-467.000.

Fusco, Jeffery K.: *See—*
Mrozowski, Joseph E.; Fusco, Jeffery K.; and Albaisa, Alfonso, 5,183,192, Cl. 224-42.210.

Fuse, Tadashi: *See—*
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.

G A Industries, Inc.: *See—*
Lescovich, Joseph E., 5,183,568, Cl. 210-360.100.

G-C Acquisition, Inc.: *See—*
Day, David R.; and Bybordi, Farhad, 5,184,077, Cl. 324-693.000.

G & H Technology, Inc.: *See—*
Stephenson, Roger C.; and Hyatt, Hugh M., 5,183,698, Cl. 428-209.000.

Gabel, Richard A.: *See—*
Williams, Robert; Sirvet, Enn; and Gabel, Richard A., 5,183,145, Cl. 198-441.000.

Gaber Bruce P.: *See—*
Ligler, Frances S.; Gaber Bruce P.; Kusterbeck, Anne W.; and Wemhoff, Gregory A., 5,183,740, Cl. 435-7.320.

Gadkaree, Kishor P.: *See—*
Beall, George H.; Gadkaree, Kishor P.; Grandi, Thomas P.; and Quinn, Candace J., 5,183,607, Cl. 264-41.000.

Gadreau, Jean; and Pascal, Andre, to Bull, S.A. High coupling transformer adapted to a chopping supply circuit. 5,184,103, Cl. 336-84.00C.

Gagemaker, Inc.: *See—*
Frank, Jimmy L.; Wolfe, John R., Jr.; and Douglas, James R., 5,182,862, Cl. 33-199.00R.

Galardy, Richard E.; and Grobelny, Damian. Matrix metalloprotease inhibitors. 5,183,900, Cl. 548-495.000.

Gale, John A. Interlocking strain relief shelf bracket. 5,183,232, Cl. 248-220.200.

Gallagher, William J.; and Worthington, Thomas K., to International Business Machines Corp. Oriented superconductors for AC power transmission. 5,183,970, Cl. 174-125.100.

Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, to Roussel Uclaf. 1-azabicycloalkane derivatives, their preparation process and their use as medicaments. 5,183,893, Cl. 546-133.000.

Galliani, Giulio: *See—*
Toja, Emilio; Bonetti, Carla; Barzaghi, Fernando; and Galliani, Giulio, 5,183,896, Cl. 546-326.000.

Galvez, Bennie R. Seasonal attic turbine ventilator. 5,183,435, Cl. 454-18.000.

Gano, John C., to Otis Engineering Corporation. Safety valve. 5,183,115, Cl. 166-319.000.

Garcia, George: *See*—
Higginbotham, Jeff A.; Garcia, George; and Richards, Robert L., 5,183,340, Cl. 384-420.000.
Garcia, Jesus G.: *See*—
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; De Gamboa, Cristina R. F.; Garcia, Jesus G.; and Berlanga, Jose M. C., 5,183,821, Cl. 514-296.000.
Garelick, Paul: *See*—
Login, Robert B.; Merianos, John J.; Biss, Russell B.; and Garelick, Paul, 5,183,901, Cl. 548-543.000.
Garman, Shelly N.: *See*—
Bohrn, Walter J.; Diffenbaugh, Kimberly S.; Garman, Shelly N.; and Khanpara, Jatin C., 5,183,704, Cl. 428-305.500.
Garn, Gene D.: *See*—
Siwek, C. Kenneth; Flower, Wallace C.; and Garn, Gene D., 5,183,137, Cl. 188-381.000.
Garrison, Judd F.; and Blanchard, Russell O., to Batts, Inc. Hangers with long lasting non-slip surfaces. 5,183,191, Cl. 223-96.000.
Garrison, Linn C.: *See*—
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,182,851, Cl. 29-827.000.
Garro, Samuel J.: *See*—
Martin, James H.; and Garro, Samuel J., 5,183,187, Cl. 222-287.000.
Garst, Michael E.: *See*—
Lee, Gary C. M.; Garst, Michael E.; and Sachs, George, 5,183,906, Cl. 549-218.000.
Gas Research Institute: *See*—
Virkar, Anil V.; and Fung, Kuan-Zong, 5,183,801, Cl. 501-152.000.
Gass, William R.: *See*—
Snyder, Thomas S.; Gass, William R.; Worcester, Samuel A.; Ayers, Laura J.; and Boris, Gregory F., 5,183,541, Cl. 204-105.00R.
Gassen, Karl-Rudolf: *See*—
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,183,932, Cl. 560-330.000.
Gates Rubber Company, The: *See*—
Lee, Albert H., Jr.; and Sabo, Carl H., 5,183,108, Cl. 166-187.000.
Gatten, Ronald A.; Miller, Leslie A.; McCall, Thomas J., Jr.; and Nau, Vance J., to Spectra-Physics, Inc. Apparatus for degassing a liquid. 5,183,486, Cl. 55-159.000.
Gatts, James D.; Buckley, Edward M.; and Jamieson, John W., to Infant Advantage, Inc. Infant environmental transition system and method. 5,183,457, Cl. 600-21.000.
Gauthier, Lloyd W., to Zenith Data Systems Corporation. Fluorescent backlight flicker control in an LCD display. 5,184,117, Cl. 340-784.000.
Gavagna, Libero, to MIGEN S.r.l. Device for the operation of hoses containing a liquid under very high pressure. 5,183,218, Cl. 242-54.00R.
Gavin, Daniel J. Spray nozzle. 5,183,206, Cl. 239-317.000.
Gaymar Industries, Inc.: *See*—
Gusakov, Ignaty, 5,184,112, Cl. 340-573.000.
GEC-Marconi Electronic Systems Corp.: *See*—
Paradise, Ronald Y., 5,184,135, Cl. 342-149.000.
GEC-Marconi Limited: *See*—
Ellis, Stafford M., 5,184,231, Cl. 359-13.000.
Gedrat, Klaus: *See*—
Bressel, Burkhard; Meyer, Heinrich; Meyer, Walter; and Gedrat, Klaus, 5,183,552, Cl. 205-158.000.
Gee, Glendon W.: *See*—
Treat, Russell L.; Gee, Glendon W.; and Whyatt, Greg A., 5,183,355, Cl. 405-128.000.
Geistlinger, Dewey F. Paint can shaker. 5,183,334, Cl. 366-129.000.
Gejima, Seiji; Kawakita, Koji; Kimura, Suzushi; Okinaka, Hideyuki; and Hakotani, Yasuhiko, to Matsushita Electric Industrial Co., Ltd. Dielectric material, and a condenser made from the same. 5,183,786, Cl. 501-134.000.
Gelardi, Paul J.: *See*—
Lowry, Alan B.; Gelardi, Paul J.; and Rochelo, Donald R., 5,184,255, Cl. 360-60.000.
Gellner, Harald, to Mercedes-Benz AG. Change-speed gearbox hand lever connecting device. 5,182,964, Cl. 74-523.000.
Gemtex Company Limited: *See*—
Grimes, John R., 5,183,479, Cl. 51-293.000.
GenCorp Inc.: *See*—
Brown, Robert L.; Baxter, David E.; and England, Todd A., 5,183,509, Cl. 118-696.000.
Brown, Robert L.; and Baxter, David E., 5,183,605, Cl. 264-40.500.
Edwards, Charles O., 5,183,613, Cl. 264-171.000.
General Dynamics Corp., Air Defense Systems Division: *See*—
Hethcoat, Gary L., 5,183,066, Cl. 134-54.000.
General Dynamics Land Systems, Inc.: *See*—
VanSweden, Harry, 5,183,287, Cl. 280-705.000.
General Electric Company: *See*—
Bools, William G., 5,183,417, Cl. 439-610.000.
Challberg, Roy C.; and Townsend, Harold E., 5,183,627, Cl. 376-352.000.
Cox, Jerry D.; Linz, Raymond E.; Thome, Jeanne M.; Perry, Winfield B.; Hadley, Franklin O., Jr.; and Knobel, Vladimir A., 5,182,881, Cl. 51-7.000.
Daiber, Paul C.; Greenwood, Anthony P.; and Bailey, Ted E., 5,183,342, Cl. 384-475.000.
Gilchrist, Alan R.; Sullivan, Thomas J.; and Walker, Roger C., 5,182,906, Cl. 60-226.100.
Gilchrist, Alan R.; Duran, Edward M.; Dry, Dennis P.; and Berry, Robert R., 5,183,389, Cl. 416-193.00A.
Horn, Dale W., 5,184,279, Cl. 361-356.000.
Lee, Ching-Pang; Rieck, Harold P., Jr.; Palmer, Nicholas C.; and Fargher, David G. W., 5,183,385, Cl. 416-97.00R.
Martin, Jack R., 5,182,855, Cl. 29-889.220.
Neugebauer, Constantine A.; Glascock, Homer H., II; Paik, Kyung W.; McMullen, James G.; and Neugebauer, Martha M., 5,184,206, Cl. 257-762.000.
Osteen, Mitchell M., 5,183,328, Cl. 362-294.000.
Stransky, Larry W.; Boehm, Valentine R., Jr.; and Phillips, Michael A., 5,182,905, Cl. 60-204.000.
General Mills, Inc.: *See*—
Seaborne, Jonathan, 5,183,787, Cl. 501-143.000.
General Motors Corporation: *See*—
Bilge, Umit; Jurczyszyn, Christopher E.; and Jenuwine, William C., 5,183,992, Cl. 219-121.640.
Graber, David W.; Eckhardt, Dennis C.; Pawlak, Andrzej M.; and Faist, Bryan L., 5,184,297, Cl. 364-424.050.
Hogan, Martin A.; Leppek, Kevin G.; and Spadafora, Peter J., 5,184,299, Cl. 364-426.020.
Partin, Dale L.; and Heremans, Joseph P., 5,184,106, Cl. 338-32.00R.
Pelachyk, Richard; Satterlee, Lowell W.; Zuccaro, Dante C.; and Farris, Timothy M., 5,183,302, Cl. 292-336.300.
Wilhelm, Richard D.; and Adonakis, Nikolaos A., 5,183,974, Cl. 181-0.500.
Geng, Qiquan: *See*—
Yuyama, Junpei; Geng, Qiquan; Chihara, Kazunori; Minami, Hirofumi; and Goto, Eiichi, 5,184,072, Cl. 324-248.000.
Genlyte Group Incorporated, The: *See*—
Rishel, Michael; Powers, Larry; and Barozzini, Claude, 5,183,330, Cl. 362-372.000.
Gentile, Philip J.: *See*—
Hesse, Bradley J.; and Gentile, Philip J., 5,184,058, Cl. 320-4.000.
Gerbino, Anthony J., to U-SUS Distributors, Inc. Hydrophobic inorganic materials and process for making same. 5,183,710, Cl. 428-405.000.
Gerdes, Richard C., to WavePhore, Inc. Bandwidth compression and expansion system. 5,184,218, Cl. 358-133.000.
Gerrans, Wilbur, to Pakon, Inc. Slide mounter with movable knife assembly. 5,182,897, Cl. 53-520.000.
Getzmann, Hermann. Grinding appliance. 5,183,215, Cl. 241-62.000.
Gharagozloo, Hamid: *See*—
Montasham, Mani; and Gharagozloo, Hamid, 5,183,094, Cl. 160-370.200.
Ghisalba, Oreste: *See*—
Ramos, Gerado; Ghisalba, Oreste; Schar, Hans-Peter; Frei, Bruno; Maienfisch, Peter; and O'Sullivan, Anthony C., 5,183,749, Cl. 435-119.000.
Ghoda, Isamu: *See*—
Ohyama, Tsukasa; Shimokawa, Yasushi; Ghoda, Isamu; Takuma, Keisuke; and Koshida, Hitoshi, 5,183,474, Cl. 8-471.000.
Gibson, Christopher M.: *See*—
Chary, Henry H.; Fitgibbon, Thomas F.; and Gibson, Christopher M., 5,183,150, Cl. 198-782.000.
Gibson, William R.: *See*—
Meeker, Paul K.; and Gibson, William R., 5,183,311, Cl. 297-151.000.
Gilby, Anthony C.; and Carson, William W., to Millipore Corporation. Photometric apparatus with a flow cell coated with an amorphous fluoronolymer. 5,184,192, Cl. 356-246.000.
Gilchrist, Alan R.; Sullivan, Thomas J.; and Walker, Roger C., to General Electric Company. Hybrid spinner nose configuration in a gas turbine engine having a bypass duct. 5,182,906, Cl. 60-226.100.
Gilchrist, Alan R.; Duran, Edward M.; Dry, Dennis P.; and Berry, Robert R., to General Electric Company. Anti-rock blade tang. 5,183,389, Cl. 416-193.00A.
Gillett, Frank E.: *See*—
Burchill, Gary W.; Gillett, Frank E.; Ramaswamy, Rajan; and Winslow, Peter S., 5,182,877, Cl. 43-54.100.
Gilmour, Hugh S. A.: *See*—
Sarraf, Sanwal P.; Weber, Sharon W.; Gilmour, Hugh S. A.; and Ficcaglia, Linda I., 5,183,798, Cl. 503-227.000.
Gimby, David R.: *See*—
Aubel, John A.; Devall, Jeffrey E.; Gimby, David R.; and Shipp, Philip A., 5,183,087, Cl. 141-59.000.
Giordano, Claudio; and Paiocchi, Maurizio, to Zambon Group S.p.A. Process for the preparation of 5-(2',4'difluorophenyl)-salicylic acid in pure form II. 5,183,935, Cl. 562-469.000.
GKN Automotive: *See*—
Heymann, Norbert, 5,182,866, Cl. 33-645.000.
GKN Automotive, Inc.: *See*—
Schneider, Dean J., 5,183,351, Cl. 403-50.000.
Glad, Mark D.: *See*—
Birkholz, Ronald B.; and Glad, Mark D., 5,183,705, Cl. 428-343.000.
Glascock, Homer H., II: *See*—
Neugebauer, Constantine A.; Glascock, Homer H., II; Paik, Kyung W.; McMullen, James G.; and Neugebauer, Martha M., 5,184,206, Cl. 257-762.000.
Glaser, Philippe: *See*—
Danchin, Antoine; Glaser, Philippe; Krin, Evelyne; Barzu, Octavien; Ladant, Daniel; and Ullmann, Agnes, 5,183,745, Cl. 435-69.100.

Glaxo Group Limited: *See*—
Coates, Ian H.; Oxford, Alexander W.; North, Peter C.; and Price, Barry J., 5,183,820, Cl. 514-292.000.
Glazer, Itamar: *See*—
Popiel, Irene; Holtemann, Karen D.; Glazer, Itamar; and Womersley, Christopher, 5,183,950, Cl. 800-2.000.
Glen, Bryan D. Baseboard with movable electrical outlet. 5,183,406, Cl. 439-120.000.
GMI Holdings, Inc.: *See*—
Smith, James F.; and Schroeder, Wesley A., 5,183,982, Cl. 200-61.850.
Gober, Michael J.: *See*—
Hojnacki, Robert J.; Pearson, Daniel C.; Brucker, Gerard K.; Gober, Michael J.; and Shaw, Daniel J., Jr., 5,183,159, Cl. 206-583.000.
Goe, Gerald L.: *See*—
McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,183,895, Cl. 546-304.000.
Goetz, Frederick J.: *See*—
Forguy, Christian; Goetz, Frederick J.; Graeber, Edward L.; and Lindstrom, Michael J., 5,183,915, Cl. 558-341.000.
Goff, Dane A.: *See*—
Carroll, Stephen F.; and Goff, Dane A., 5,183,904, Cl. 549-68.000.
Goff, Gerald L.: *See*—
DiNapoli, Antonio; Goff, Gerald L.; and Sikes, Roger A., 5,183,245, Cl. 269-254.00R.
Gold Star Co., Ltd.: *See*—
Choi, Hoon B., 5,184,180, Cl. 355-219.000.
Golden Cat Corporation: *See*—
Raymond, Marvin L.; Barrett, Dana G.; and Greene, Phillip B., 5,183,010, Cl. 119-172.000.
Goldner, Eric L., to Litton Systems, Inc. Triaxial fiber optic Sagnac interferometer with single source and detector. 5,184,195, Cl. 356-350.000.
Goldsby, Irma J. Layered reducing garment. 5,182,812, Cl. 2-79.000.
Goldschneider, James D.: *See*—
Zakheim, Howard; Clinton, Peter M.; Goldschneider, James D.; Kasmer, Christopher A.; Zahn, Markus; and Hoffmeyer, Charles L., 5,183,214, Cl. 241-30.000.
Goldstar Co., Ltd.: *See*—
Choi, Bo H., 5,184,264, Cl. 360-105.000.
Im, Jong H., 5,184,045, Cl. 315-39.510.
Goldstar Electron Co., Ltd.: *See*—
Chung, Jin Y.; and Kwak, Deog Y., 5,184,030, Cl. 307-296.010.
Kim, Cheong W., 5,184,087, Cl. 330-253.000.
Gomes, Joseph: *See*—
Wizani, Wolfgang; Esterbauer, Hermann; Steiner, Walter; and Gomes, Joseph, 5,183,753, Cl. 435-201.000.
Gomez, Peter M., to Monsanto Company. Polyblends containing polyurethane, polymer and siloxane crosslinker. 5,183,852, Cl. 525-101.000.
Gomi, Akihiro: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.
Gomi, Shintaro: *See*—
Inohana, Haruyuki; and Gomi, Shintaro, 5,184,086, Cl. 330-252.000.
Goodrich, Rollie M.: *See*—
Herdzina, Frank J.; and Goodrich, Rollie M., 5,182,934, Cl. 72-405.000.
Goodworth, John P. Panel, clip and method of mounting panel. 5,182,893, Cl. 52-745.050.
Gorenc, Daniel L.: *See*—
Elicker, Robert W.; and Gorenc, Daniel L., 5,183,405, Cl. 439-108.000.
Gorlich, Karl J.; Bauer, Fritz U.; and Konetzka, Joerg, to Dentsply G.m.b.H. Pasty dental veneer making composition. 5,183,834, Cl. 523-105.000.
Goro S. A.: *See*—
Schick, Jean-Francois, 5,182,933, Cl. 72-335.000.
Gorun, Sergiu M.: *See*—
Stibrany, Robert T.; and Gorun, Sergiu M., 5,183,945, Cl. 568-574.000.
Gose, Mark W.: *See*—
Kesler, Scott B.; and Gose, Mark W., 5,184,036, Cl. 307-540.000.
Goto, Eiichi: *See*—
Yuyama, Junpei; Geng, Qiquan; Chihara, Kazunori; Minami, Hirofumi; and Goto, Eiichi, 5,184,072, Cl. 324-248.000.
Goto, Hideo: *See*—
Yamaguchi, Soichiro; Matsuda, Koichi; and Goto, Hideo, 5,183,849, Cl. 525-68.000.
Goto, Shigeki, to Aisin Seiki Kabushiki Kaisha. Hydraulic control device for automatic transmission. 5,182,969, Cl. 74-866.000.
Goto, Shigeki; Shimei, Masato; Miyazawa, Tetsuhiro; Saitou, Yoshitami; and Isono, Nobuyuki, to Aisin Seiki Kabushiki Kaisha. Hydraulic control system for automatic transmission. 5,182,970, Cl. 74-866.000.
Goto, Yoshiaki; and Arai, Kozo, to Tokushu Kika Kogyo Co., Ltd. Micro-particulate aluminosilicate and process for producing the same. 5,183,650, Cl. 423-710.000.
Gotoh, Yasuharu: *See*—
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Harada, Isao; Hokonohara, Hisashi; and Yamaguchi, Toshiaki, to Mitsui Toatsu Chemicals, Inc. Method for purifying nitrogen trifluoride gas. 5,183,647, Cl. 423-239.000.
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Twigg, Ray G.; Klug, Mark W.; Marrone, Santino; and Hawkes, Malcolm V., 5,184,068, Cl. 324-158.00F.

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Line, Henri, 5,183,374, Cl. 409-286.000.

Hella KG Hueck & Co.: *See*—
Hussmann, Micha; and Hufnagel, Joachim, 5,184,024, Cl. 307-10.800.

Helle, Jean-Louis; Andre, Jean-Claude; and Schaeffer, Philippe, to Dassault Aviation. Process of and apparatus for making three-dimensional objects. 5,183,598, Cl. 264-22.000.

Hellsten, Martin: *See*—
Carlsson, Goran; and Hellsten, Martin, 5,183,476, Cl. 44-445.000.

Helmrich, Harald: *See*—
Hanel, Peter; Helmrich, Harald; and Sander, Ulrich, 5,183,571, Cl. 210-649.000.

Henkel Corporation: *See*—
Elsasser, A. Frederick; and Korte, Thomas J., 5,183,908, Cl. 549-322.000.

Henmi, Naoya; Suzaki, Tetsuyuki; and Saito, Tomoki, to NEC Corporation. Optical transmitting apparatus for minimal dispersion along an optical fiber. 5,184,243, Cl. 359-181.000.

Henry, Joseph B.: *See*—
Langhorst, Martin A.; and Henry, Joseph B., 5,183,604, Cl. 264-40.100.

Henry, Wayne L.: *See*—
Kreh, Robert P.; and Henry, Wayne L., 5,183,573, Cl. 210-697.000.

Hensens, Otto D.: *See*—
Bills, Gerald F.; Hensens, Otto D.; Koupal, Lawrence; Lingham, Russell B.; Ondeyka, John G.; and Zink, Deborah L., 5,183,826, Cl. 514-411.000.

Heppenstiel, Gerhard: *See*—
D'Heureuse, Walter; Greive, Martin; Heppenstiel, Gerhard; and Kusch, Hans-Jurgen, 5,182,989, Cl. 101-148.000.
Herbst, Joseph A.: *See*—
Chitnis, Girish K.; Herbst, Joseph A.; and Valyocsik, Ernest W., 5,183,790, Cl. 502-67.000.
Hercules Incorporated: *See*—
Greiner, Richard W., 5,183,663, Cl. 424-443.000.
Herdzina, Frank J.; and Goodrich, Rollie M., to Service Tool Die & Mfg. Co. Dual lane conversion system. 5,182,934, Cl. 72-405.000.
Heremans, Joseph P.: *See*—
Partin, Dale L.; and Heremans, Joseph P., 5,184,106, Cl. 338-32.00R.
Hergert, Richard E.; Hergert, Richard R.; Neill, Eugene B.; Pantaleo, Scott B.; Roerig, Arnold J.; Rogers, Thomas D.; Shands, Jay A.; and Takeguchi, Noriaki, to Beloit Technologies, Inc. Headbox tube bank apparatus and method of directing flow therethrough. 5,183,537, Cl. 162-216.000.
Hergert, Richard R.: *See*—
Hergert, Richard E.; Hergert, Richard R.; Neill, Eugene B.; Pantaleo, Scott B.; Roerig, Arnold J.; Rogers, Thomas D.; Shands, Jay A.; and Takeguchi, Noriaki, 5,183,537, Cl. 162-216.000.
Herman Miller, Inc.: *See*—
McClung, Duane G.; and Mueller, Thomas C., 5,183,090, Cl. 144-350.000.
Hernandez, Trinidad. Bottle sling apparatus. 5,183,183, Cl. 222-175.000.
Herrington, Thomas L.: *See*—
Nguyen, My N.; Lee, Chee-Kong; and Herrington, Thomas L., 5,183,784, Cl. 501-19.000.
Herron, Carlisle M.; and Cooper, David J., to Procter & Gamble Cellulose Company, The. Individualized, polycarboxylic acid crosslinked fibers. 5,183,707, Cl. 428-364.000.
Hershenson, Susan: *See*—
Shaked, Ze'Ev; Stewart, Tracy; Hershenson, Susan; Thomson, James W.; Taforo, Terrance; and Thomson, Jody, 5,183,746, Cl. 435-69.510.
Hershey Foods: *See*—
Lai, Chron-Si, 5,183,682, Cl. 426-636.000.
Hess, Heinrich: *See*—
Kopp, Richard; Grogler, Gerhard; and Hess, Heinrich, 5,183,876, Cl. 528-59.000.
Hesse, Bradley J.; and Gentile, Philip J., to Fleming Group, The. Method and system for electricity storage and discharge. 5,184,058, Cl. 320-4.000.
Hethcoat, Gary L., to General Dynamics Corp., Air Defense Systems Division. Spray nozzle cleaning apparatus and method. 5,183,066, Cl. 134-54.000.
Hewlett-Packard Company: *See*—
Foote, Wayne E.; Mui, Paul K.; and Sleger, Roger R., 5,184,265, Cl. 360-106.000.
King, Philip N., 5,184,029, Cl. 307-270.000.
Meichsner, Roland; and Schmickl, Werner, 5,183,502, Cl. 106-22.00K.
Wanger, Mark E.; Methlie, Jennifer L.; Stavely, Donald J.; and Oliver, Thomas C., 5,184,336, Cl. 369-34.000.
Heymann, Kurt: *See*—
Tenbrink, Detlef; Bock, Martin; Heymann, Kurt; and Rimkus, Martin, 5,183,553, Cl. 205-162.000.
Heymann, Norbert, to GKN Automotive. Apparatus and method for identifying the lateral position of a workpiece. 5,182,866, Cl. 33-645.000.
Higaki, Riichi: *See*—
Iida, Yoshikazu; Kosaka, Toru; Tsuru, Hiroyuki; Higaki, Riichi; and Katayama, Akira, 5,184,167, Cl. 354-403.000.
Higashi, Taketoshi: *See*—
Yagi, Shigeru; Fukuda, Yuzuru; Higashi, Taketoshi; and Yokoi, Masaki, 5,183,719, Cl. 430-66.000.
Higginbotham, Jeff A.; Garcia, George; and Richards, Robert L., to Amoco Corporation. Bearing and bearing assembly. 5,183,340, Cl. 384-420.000.
Higuchi, Kazuhiko; Hirahara, Shuzo; Saito, Tutomu; Nagato, Hitoshi; and Iwamoto, Akito, to Kabushiki Kaisha Toshiba. Apparatus for printing images on booklets. 5,183,347, Cl. 400-583.300.
Hijikata, Kenji: *See*—
Kanaka, Keiichi; Hayashi, Noriyuki; Kobashi, Toshihiro; Kageyama, Yukihiko; and Hijikata, Kenji, 5,183,878, Cl. 528-193.000.
Kawaguichi, Kuniaki; Nakane, Toshio; Shimoda, Akihide; and Hijikata, Kenji, 5,183,623, Cl. 264-544.000.
Hille, Dieter: *See*—
Gross, Lutz-Werner; Poth, Ulrich; Hille, Dieter; and Weidemeier, Klaus, 5,183,835, Cl. 523-402.000.
Hillsman, Cecily M.: *See*—
Dubrul, William R.; and Hillsman, Cecily M., 5,183,464, Cl. 128-3.000.
Hilmar, Martin D.: *See*—
Najjar, Mitri S.; and Hilmar, Martin D., 5,183,482, Cl. 55-16.000.
Himont Incorporated: *See*—
Guerra, Gaetano; Vitagliano, Vincenzo M.; Corradini, Paolo; and Albizzati, Enrico, 5,183,853, Cl. 525-132.000.
Hintzen, Ulirich: *See*—
Bruckner, Raimund; Hintzen, Ullrich; Lee, Steve; Schuler, Andreas; and Wiesel, Martin, 5,183,624, Cl. 266-236.000.
Hirabayashi, Hiromitsu: *See*—
Takayanagi, Yoshiaki; and Hirabayashi, Hiromitsu, 5,184,178, Cl. 355-202.000.
Hirahara, Shuzo: *See*—
Higuchi, Kazuhiko; Hirahara, Shuzo; Saito, Tutomu; Nagato, Hitoshi; and Iwamoto, Akito, 5,183,347, Cl. 400-583.300.
Hirako, Keiichi; and Kawaguchi, Yoshihisa, to Kabushiki Kaisha Toshiba. Antenna pointing equipment. 5,184,139, Cl. 342-354.000.
Hirakouchi, Hiroshi: *See*—
Nakamura, Masanori; Hirakouchi, Hiroshi; Yatsuka, Takeshi; Kadowaki, Nobuo; and Endoh, Hiroshi, 5,183,863, Cl. 525-438.000.
Hirano, Shin-ichi: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijiko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.
Hirata, Mistutoshi: *See*—
Yosomiya, Ryutoku; Hirata, Mistutoshi; Morimoto, Kiyotaka; Takenishi, Soichiro; and Marutsuka, Toshinori, 5,183,611, Cl. 264-129.000.
Hirose, Naoki: *See*—
Yamazaki, Shunpei; Hayashi, Shigenori; Inujima, Takashi; and Hirose, Naoki, 5,183,511, Cl. 118-723.000.
Hirota, Ken: *See*—
Kugimiya, Koichi; Sugaya, Yasuhiro; Inoue, Osamu; Satomi, Mitsuo; and Hirota, Ken, 5,183,631, Cl. 419-10.000.
Hirota, Toshikazu: *See*—
Takeuchi, Yukihisa; Hirota, Toshikazu; Okada, Shigeki; and Shimogawa, Natsumi, 5,184,344, Cl. 369-126.000.
Hirota, Yukitsugu: *See*—
Mihara, Teruyoshi; Matsushita, Tsutomu; Yao, Kenji; Hoshi, Masakatsu; Enokido, Yutaka; and Hirota, Yukitsugu, 5,184,204, Cl. 357-629.000.
Hirst, Ian J.: *See*—
Oswald, Thomas; and Hirst, Ian J., 5,184,081, Cl. 324-533.000.
Hisano, Seiichi: *See*—
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, 5,183,630, Cl. 419-31.000.
Hishikawa, Toshio: *See*—
Wakino, Kikuo; Hishikawa, Toshio; Ishikawa, Youhei; Takehara, Koichi; and Tanizaki, Toru, 5,184,096, Cl. 333-175.000.
Hitachi Chemical Company Ltd.: *See*—
Ichimura, Nobuo; Miyamoto, Yauso; and Yamazaki, Mitsuo, 5,183,592, Cl. 252-512.000.
Miwa, Takao; Ikeda, Takayoshi; Numata, Shunichi; Fujisaki, Koji; and Shimanoki, Hisae, 5,183,838, Cl. 524-109.000.
Hitachi Construction Machinery Co., Ltd.: *See*—
Akasaka, Yoshimichi; Nakamura, Ichiro; and Gotoh, Yasuharu, 5,182,978, Cl. 91-499.000.
Hitachi Haramachi Semi-Conductor Ltd.: *See*—
Suda, Koichi; Matsuzaki, Hitoshi; Wada, Masayuki; and Ozeki, Shoichi, 5,184,272, Cl. 361-87.000.
Hitachi Koki Co., Ltd.: *See*—
Kurosawa, Makoto; Koseki, Masaaki; Takahashi, Tetsuroh; and Terakado, Takeshi, 5,183,454, Cl. 493-459.000.
Hitachi, Ltd.: *See*—
Hamada, Yasunori; Oizumi, Junichi; Noda, Kousuke; and Ushijima, Kunio, 5,184,000, Cl. 235-379.000.
Kawamura, Yoshio; Tanaka, Shinji; Sato, Kazuo; Uchida, Kenko; and Kohida, Hiroyuki, 5,183,744, Cl. 435-30.000.
Kogure, Makoto; Sase, Akira; and Fukunaga, Masao, 5,184,121, Cl. 340-870.110.
Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, 5,184,346, Cl. 370-60.000.
Masuda, Noboru; Kamikawai, Ryotaro; Yagyu, Masayoshi; Yamamoto, Masakazu; Itoh, Hiroyuki; and Saito, Tatsuya, 5,184,027, Cl. 307-269.000.
Miwa, Takao; Ikeda, Takayoshi; Numata, Shunichi; Fujisaki, Koji; and Shimanoki, Hisae, 5,183,838, Cl. 524-109.000.
Nagai, Masahiko; Watai, Hiroo; Nagumo, Takaharu; and Moriwaki, Kaoru, 5,184,308, Cl. 364-489.000.
Ogushi, Tetsuya; Hakuraku, Yoshinori; and Ogata, Hisanao, 5,183,799, Cl. 505-1.000.
Sakai, Keijiro; Endo, Tunehiro; Kubota, Yuzuru; Ikimi, Takashi; Mutoh, Nobuyoshi; and Honbu, Mitsuyuki, 5,184,057, Cl. 318-803.000.
Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.
Shimada, Toshio; Kobayashi, Morio; Tada, Takemi; and Kawaminami, Shigeya, 5,184,269, Cl. 361-24.000.
Suda, Koichi; Matsuzaki, Hitoshi; Wada, Masayuki; and Ozeki, Shoichi, 5,184,272, Cl. 361-87.000.
Tada, Takemi; Tanaka, Hirosi; and Usui, Osami, 5,183,400, Cl. 417-572.000.
Takeuchi, Hiroyuki; Nozokido, Tatsuo; and Nakamura, Chikako, 5,184,073, Cl. 324-309.000.
Uchida, Makio, 5,184,202, Cl. 257-390.000.
Hitachi Medical Corporation: *See*—
Nishimura, Hiroshi, 5,184,075, Cl. 324-309.000.
Takeuchi, Hiroyuki; Nozokido, Tatsuo; and Nakamura, Chikako, 5,184,073, Cl. 324-309.000.
Hitachi Metals, Ltd.: *See*—
Nakajima, Shin; Aoyama, Hiroyuki; Kagawa, Rihito; and Shimoe, Osamu, 5,184,085, Cl. 328-65.000.
Hitachi VLSI Engineering Corporation: *See*—
Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, 5,184,346, Cl. 370-60.000.

HL Planartechnik GmbH: *See*—
Fidelak, Michael; and Bartsch, Marlies, 5,182,947, Cl. 73-304.00C.
Ho, Jackson. Punching and binding machine. 5,183,361, Cl. 412-16.000.
Ho-jin, Cho; and Choi, Sang-sin, to Samsung Electron Devices Co., Ltd. Shadow mask stretching apparatus for flat cathode ray tube. 5,183,426, Cl. 445-68.000.
Ho, Kelvin K.: *See*—
Farwell, Charles Y.; Hearn, Michel L.; Heidebrecht, Richard M.; Ho, Kelvin K.; and Spencer, Douglas A., 5,184,347, Cl. 370-94.100.
Hobbs, Donna M. Method for cleaning pierced earlobes. 5,183,461, Cl. 604-49.000.
Hobes, John; and Barth, Christiane, to Hoechst Aktiengesellschaft. Graft copolymer based on an ultrahigh-molecular-weight polyethylene and an ethylene copolymer. 5,183,855, Cl. 525-193.000.
Hochman, Lana: *See*—
Pan, Yuh-Guo; Chan, Alexander; and Hochman, Lana, 5,183,941, Cl. 564-390.000.
Hocker, Robert A.: *See*—
McCurry, Patrick W.; Kellogg, James R.; Boekelheide, Karl; Sexton, Kenneth D.; Ellison, George A.; and Hocker, Robert A., 5,184,025, Cl. 307-66.000.
Hocking, Michael G.: *See*—
Sidky, Paulette S.; and Hocking, Michael G., 5,183,985, Cl. 219-10.61R.
Hoechst Aktiengesellschaft: *See*—
Hobes, John; and Barth, Christiane, 5,183,855, Cl. 525-193.000.
Schimmel, Gunther; Kotzian, Michael; and Gradl, Reinhard, 5,183,651, Cl. 423-334.000.
Hoechst Celanese Corporation: *See*—
Platzer, Stephan J. W.; Procter, Arthur E.; and Dunder, Thomas, 5,183,723, Cl. 430-160.000.
Hoegnelid, Kurt: *See*—
Dalen, Bjoern; Nilsson, Kenth-Ake-Sune; Hoegnelid, Kurt; and Wecke, Liliane, 5,183,056, Cl. 128-782.000.
Hoffman, Eric A.; Hanson, C. William, III; and Ward, Charles F., III, to University of Pennsylvania, The Trustees of the. Gated programmable ventilator. 5,183,038, Cl. 128-204.210.
Hoffman, Paul. Centrifugal nozzle. 5,183,205, Cl. 239-222.130.
Hoffman, Ronald J.; Pillion, Lawrence M.; and Jewell, Paul L., to Mr. Coffee Inc. Apparatus and method for heating water for infusion and the like. 5,183,998, Cl. 219-492.000.
Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, to Siemens Aktiengesellschaft. Integrated semiconductor memory of the dram type and method for testing the same. 5,184,326, Cl. 365-201.000.
Hoffmeyer, Charles L.: *See*—
Zakheim, Howard; Clinton, Peter M.; Goldschneider, James D.; Kasmer, Christopher A.; Zahn, Markus; and Hoffmeyer, Charles L., 5,183,214, Cl. 241-30.000.
Hogan, Martin A.; Leppek, Kevin G.; and Spadafora, Peter J., to General Motors Corporation; and Deleco Electronics Corporation. Antilock brake system motor speed control. 5,184,299, Cl. 364-426.020.
Hojnacki, Robert J.; Pearson, Daniel C.; Brucker, Gerard K.; Gober, Michael J.; and Shaw, Daniel J., Jr., to United Foam Plastics. Suspension cushioning package. 5,183,159, Cl. 206-583.000.
Hokonohara, Hisashi: *See*—
Harada, Isao; Hokonohara, Hisashi; and Yamaguchi, Toshiaki, 5,183,647, Cl. 423-239.000.
Holbrook, Michael T.; Hebert, Lawrence A.; Najmy, Stephen W.; Stine, Ernest F., Jr.; and Hasche, Reimer, to Dow Chemical Company, The. Catalyst for hydrohalogenation of hydrocarbons. 5,183,797, Cl. 502-355.000.
Holcombe, Cressie E.: *See*—
Lauf, Robert J.; Holcombe, Cressie E.; and Dykes, Norman L., 5,184,286, Cl. 361-529.000.
Holland, Douglas K.; and Dillingham, Edward W., to Texaco Inc. Process for dewatering quenched slag. 5,183,478, Cl. 48-197.00R.
Hollander, Milton B.; Jacobs, David R.; and McKinley, William E., to Omega Engineering, Inc. Molded connector with spool. 5,183,420, Cl. 439-457.000.
Hollandsche Beton Groep Nov.: *See*—
Blom, Jan, 5,183,438, Cl. 472-92.000.
Holler, Roger A.; and Ulrich, Peter R., to United States of America, Navy. Cable pack winding and payout system. 5,183,217, Cl. 242-47.000.
Hollymatic Corporation: *See*—
Wagner, Richard C., 5,182,984, Cl. 99-509.000.
Holmes, William S.; and Marshall, Robert, to Albright & Wilson Ltd. Production of phosphorus compounds. 5,183,649, Cl. 423-300.000.
Holotek Ltd.: *See*—
Kramer, Charles J., 5,183,350, Cl. 403-4.000.
Holset Engineering Company Limited: *See*—
McKean, Peter S., 5,183,381, Cl. 415-150.000.
Holtemann, Karen D.: *See*—
Popiel, Irene; Holtemann, Karen D.; Glazer, Itamar; and Womersley, Christopher, 5,183,950, Cl. 800-2.000.
Honbu, Mitsuyuki: *See*—
Sakai, Keijiro; Endo, Tunehiro; Kubota, Yuzuru; Ikimi, Takashi; Mutoh, Nobuyoshi; and Honbu, Mitsuyuki, 5,184,057, Cl. 318-803.000.
Honda, Akito. Method of producing a stuffed doll. 5,182,844, Cl. 29-469.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fujii, Isao; Ajiki, Yoshio; Ishida, Yoichi; and Matsuura, Hiromi, 5,183,011, Cl. 123-1.00A.
Kuroda, Shigetaka; and Iwata, Yoichi, 5,182,907, Cl. 60-276.000.
Nakamura, Michio; Okunosono, Toshihiko; and Kajikawa, Tsuneo, 5,183,130, Cl. 180-219.000.
Suga, Toshiyuki; Kitajima, Shinichi; and Kobayashi, Yoshihiko, 5,183,021, Cl. 123-478.000.
Yumoto, Toshiyuki; Ohsono, Kouhei; Kanda, Masahiro; and Matsuda, Takahiro, 5,183,439, Cl. 474-28.000.
Honeywell, Inc.: *See*—
Maurer, Dean J., 5,184,107, Cl. 338-42.000.
Menahem, Israel; and Bacon, James, 5,182,961, Cl. 74-471.0XY.
Nelson, Larry A., 5,184,082, Cl. 324-537.000.
Hong, Chin-Chen. Stirring device for facilitating dialysis. 5,183,564, Cl. 210-232.000.
Honma, Akihiro; and Kurokawa, Masahiro, to Mitsubishi Gas Chemical Company, Inc. Method of purifying crude glycidyl (meth)acrylate. 5,183,539, Cl. 203-38.000.
Hopkins, George I. Crawling insect trap. 5,182,879, Cl. 43-131.000.
Horak, Dieter; and Schafer, Hans-Heinz, to W. Schlafhorst AG & Co. Method and apparatus for checking the operation of a pneumatic splicer. 5,182,900, Cl. 57-22.000.
Horan, Ann C., to Schering Corporation. Production of 7-chloro-3-methoxy-2'-N-methyltetracycline with *Actinomadura brunea* ATCC 39216. 5,183,758, Cl. 435-252.100.
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, to Kao Corporation. Azole derivatives and antifungal drugs containing the same as an active component. 5,183,824, Cl. 514-383.000.
Hori, Mitsuhiko, to Nitto Denko Corporation. Composition for percutaneous administration and method for enhancing percutaneous absorption of a physiologically active ingredient empolying the same. 5,183,665, Cl. 424-449.000.
Horitani, Yoshihiro, to Suzuki Kabushiki Kaisha. Muffler assembly of internal combustion engine. 5,183,977, Cl. 181-266.000.
Horn, Dale W., to General Electric Company. Power pedestal having television, telephone and luminaire adapter unit. 5,184,279, Cl. 361-356.000.
Hornburg, Kurt P.; Thelen, Wayne A.; and Thelen, William. Automotive vehicle antenna. 5,184,142, Cl. 343-715.000.
Horng, Ming-Gin. Handle-attachable suitcase alarm. 5,184,110, Cl. 340-571.000.
Hoshi, Masakatsu: *See*—
Mihara, Teruyoshi; Matsushita, Tsutomu; Yao, Kenji; Hoshi, Masakatsu; Enokido, Yutaka; and Hirota, Yukitsugu, 5,184,204, Cl. 357-629.000.
Hoshizaki Denki Kabushiki Kaisha: *See*—
Kado, Syuji; Tatematsu, Susumu; and Ikari, Hideyuki, 5,182,917, Cl. 62-137.000.
Hoskin, Robert F. Brake for in-line roller skate. 5,183,275, Cl. 280-11.200.
Hosoi, Keiji, to Suzuki Motor Corporation. Ignition timing control apparatus for engine. 5,183,020, Cl. 123-406.000.
Hospal Industrie: *See*—
Porta, Julien; and Clermont, Christian, 5,182,868, Cl. 34-18.000.
Hottovy, John D., to Phillips Petroleum Company. Polymer recovery process. 5,183,866, Cl. 526-88.000.
Houang, Paul: *See*—
D'Iribarne, Benoit; Mairlot, Henri; and Houang, Paul, 5,183,491, Cl. 65-351.000.
House Food Industrial Co., Ltd.: *See*—
Hattori, Ryuichi; and Nakagawa, Nobuhide, 5,182,982, Cl. 99-404.000.
Okamoto, Hidefumi; and Sengoku, Koji, 5,183,681, Cl. 426-634.000.
Taga, Kazumitsu; Narukami, Toshihiko; and Miyaoku, Yoshiyuki, 5,183,678, Cl. 426-448.000.
Houseki, Sigeki: *See*—
Takeishi, Hideo; Houseki, Sigeki; and Matsubara, Isao, 5,183,210, Cl. 239-703.000.
Howard, Joseph P.: *See*—
Kelly, Edward J.; and Howard, Joseph P., 5,184,314, Cl. 364-709.010.
Howe, Harold, to Technetics Corp. Bundle and place method for the manufacture of brush seals. 5,183,197, Cl. 228-160.000.
Hsing, Zeith W. C.: *See*—
Heidebroek, Wolfgang; and Hsing, Zeith W. C., 5,184,225, Cl. 358-243.000.
Hu, Patrick C.: *See*—
Wiegand, Karl E.; and Hu, Patrick C., 5,183,061, Cl. 128-897.000.
Hubbell Incorporated: *See*—
Edgell, James E.; and Jordan, David L., 5,183,331, Cl. 362-426.000.
Hubble, Fred F., III; Mitchell, John M., Jr.; and Martin, James P., to Xerox Corporation. Linear encoder for digital printing applications. 5,184,011, Cl. 250-231.140.
Hubis, Daniel E.: *See*—
Branca, Phillip A.; Hubis, Daniel E.; Mallouk, Robert S.; and Perry, Randal L., 5,183,545, Cl. 204-252.000.
Hubsch, Walter: *See*—
Angerbauer, Rolf; Fey, Peter; Hubsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; and Schmidt, Delf, 5,183,897, Cl. 546-330.000.
Huchton, Roger L.: *See*—
MacArthur, Duncan W.; Wolf, Michael A.; McAtee, James L.; Unruh, Wesley P.; Cucchiara, Alfred L.; and Huchton, Roger L., 5,184,019, Cl. 250-380.000.
Huddle, James R., to Litton Systems, Inc. Fault-tolerant inertial navigation system. 5,184,304, Cl. 364-453.000.

Huels Aktiengesellschaft: *See*—
Warwel, Siegfried; Jagers, Hans-Gerd; and Deckers, Andreas, 5,183,791, Cl. 502-102.000.
Hufnagel, Joachim: *See*—
Hussmann, Micha; and Hufnagel, Joachim, 5,184,024, Cl. 307-10.800.
Huggett, Colin E.; and Wuertz, Kenneth L., to Allied-Signal, Inc. Fault-tolerant apparatus for controlling blade pitch. 5,183,387, Cl. 416-147.000.
Hughes Aircraft Company: *See*—
Hanz, Curtis L.; Gulick, Jon J.; Virga, Kathleen L.; and Podell, Allen, 5,184,095, Cl. 333-33.000.
Kich, Rolf; and Tatomir, Paul J., 5,184,098, Cl. 333-208.000.
Lim, Khoon C.; Margerum, J. David; Lackner, Anna M.; and Miller, Leroy J., 5,184,233, Cl. 359-46.000.
Marco, Alex A., 5,182,849, Cl. 29-600.000.
Myers, Terrence L., 5,184,127, Cl. 341-122.000.
Niho, Yoji G.; Day, Eric W.; and Flanders, Tammy L., 5,184,134, Cl. 342-25.000.
Shahriary, Iradj; and McNab, Kevin M., 5,184,092, Cl. 331-16.000.
Washburn, Robert D.; Wedeen, Robert S.; McClanahan, Robert F.; Council, William J.; and Lusher, David M., 5,184,288, Cl. 363-4.000.
Wiegel, Dave C.; Bradshaw, Dan A.; and Petravicius, Stasys, 5,184,275, Cl. 361-223.000.
Hughes Missile Systems Company: *See*—
Frenkel, Jeffry T.; and Anderson, Brent C., 5,182,941, Cl. 73-40.000.
Hughes, Richard E. Differential mechanism. 5,183,446, Cl. 475-236.000.
Huldin, Donald H.: *See*—
Yeh, Charles R.; and Huldin, Donald H., 5,183,053, Cl. 128-754.000.
Hull, Charles W.; Spence, Stuart T.; Albert, David J.; Smalley, Dennis R.; Harlow, Richard A.; Stinebaugh, Phil; Tarnoff, Harry L.; Nguyen, Hop D.; Lewis, Charles W.; Vorgitch, Tom J.; and Remba, David Z., to 3D Systems, Inc. Method and apparatus for production of high resolution three-dimensional objects by stereolithography. 5,184,307, Cl. 364-474.240.
Hunder, Ray A.: *See*—
Bodziak, Douglas P.; Grovender, Steven L.; Hunder, Ray A.; Molenda, Robert P.; and Roth, Steven P., 5,183,297, Cl. 283-67.000.
Hunter Manufacturing Inc.: *See*—
Shaughnessy, Ernie, 5,183,310, Cl. 296-106.000.
Hunter Mining Company: *See*—
Chintis, Michael, 5,183,499, Cl. 75-742.000.
Hunter, Robert L.; and Ragland, William L., to Emory University. Method of treating poultry for coccidiosis. 5,183,687, Cl. 424-78.340.
Hurdle, D. T.: *See*—
Hurdle, Terry D., 5,183,325, Cl. 362-109.000.
Hurdle, Terry D., to Hurdle, D. T. Illumination apparatus for remote control device. 5,183,325, Cl. 362-109.000.
Hurtado, Larry; Curto, Rick A.; and Martin, Dallas, to Western Atlas International, Inc. Termination assembly with improved waterblock. 5,183,966, Cl. 474-20.000.
Huschka, Hans: *See*—
Brandau, Egbert; Huschka, Hans; Kadner, Martin; and Schroder, Waldemar, 5,183,493, Cl. 75-335.000.
Huss, Albin, Jr.: *See*—
Kirker, Garry W.; Degnan, Thomas F., Jr.; Huss, Albin, Jr.; and Landis, Michael E., 5,183,559, Cl. 208-119.000.
Hussmann, Micha; and Hufnagel, Joachim, to Hella KG Hueck & Co. Apparatus for regulate the illumination range of a motor vehicle. 5,184,024, Cl. 307-10.800.
Hutcheson, Jerry D.; and Blake, William S., to Ecopac, L. P. Mechanically pressurized dispenser system. 5,183,185, Cl. 222-209.000.
Hutchinson S.A.: *See*—
Blin, Philippe, 5,183,079, Cl. 138-110.000.
Hwa, Chih M.; Kelly, John A.; Tai, Wun T.; Fan, Lai-Duien G.; Kreh, Robert P.; and Greaves, Brian, to W. R. Grace & Co.-Conn. Method of dispersing iron. 5,183,574, Cl. 210-701.000.
Hwang, Chan-Kou: *See*—
Nicolaou, Kyriacos C.; Sorensen, Erik; Hwang, Chan-Kou; Discordia, Robert; Bergman, Robert G.; and Minto, Robert E., 5,183,942, Cl. 568-375.000.
Hwang, Steven. Fiber optic illuminator display. 5,184,253, Cl. 359-889.000.
Hyatt, Hugh M.: *See*—
Stephenson, Roger C.; and Hyatt, Hugh M., 5,183,698, Cl. 428-209.000.
Ichihashi, Tadashi; and Akiyama, Koichi, to Kowa Company Limited. Ophthalmic measurement apparatus. 5,184,157, Cl. 351-208.000.
Ichikawa, Kiyomichi, to Auto-Stamp Institute Inc. Paper conveyor. 5,183,249, Cl. 271-186.000.
Ichikawa, Takashi: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.
Ichimura, Nobuo; Miyamoto, Yauso; and Yamazaki, Mitsuo, to Hitachi Chemical Company Ltd. Electroconductive adhesive comprising an epoxy novolak resin and phenol-aralkyl resin. 5,183,592, Cl. 252-512.000.
Ide, Youji; and Shiokawa, Keiichi, to Ricoh Company, Ltd. Thermal image transfer recording medium. 5,183,697, Cl. 428-195.000.
Idemitsu Kosan Co., Ltd.: *See*—
Yamasaki, Komei; and Keisuke, Funaki, 5,183,871, Cl. 526-347.200.
Ido, Mikio: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.
Iguchi, Hiroshi: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.
Iida, Akio: *See*—
Itoh, Kenji; Iida, Akio; and Urasaki, Shuji, 5,184,093, Cl. 331-25.000.
Iida, Tadasato; Takahashi, Fusakichi; Wada, Kouji; and Nigo, Toshiro, to Kabushiki Kaisha Toshiba. Portable type air conditioning apparatus. 5,182,915, Cl. 62-89.000.
Iida, Yoshikazu; Kosaka, Toru; Tsuru, Hiroyuki; Higaki, Riichi; and Katayama, Akira, to Nikon Corporation. Distance metering device of a camera. 5,184,167, Cl. 354-403.000.
Iimura, Haruo; Takiguchi, Yasuyuki; and Kanemoto, Akihiko, to Ricoh Company, Ltd. Super-twisted nematic type liquid crystal display device. 5,184,237, Cl. 359-63.000.
Ikari, Hideyuki: *See*—
Kado, Syuji; Tatematsu, Susumu; and Ikari, Hideyuki, 5,182,917, Cl. 62-137.000.
Ikeda Bussan Co., Ltd.: *See*—
Kawakita, Tadashi, 5,183,447, Cl. 475-341.000.
Ikeda, Hayato: *See*—
Fujii, Toshiro; Ikeda, Hayato; Katoh, Ryo; and Inukai, Hitoshi, 5,183,394, Cl. 417-269.000.
Ikeda, Hiroshi, to Nissan Motor Co., Ltd. A-D converter suitable for fuzzy controller. 5,184,131, Cl. 341-165.000.
Ikeda, Hitoshi: *See*—
Sohda, Takashi; and Ikeda, Hitoshi, 5,183,823, Cl. 514-358.000.
Ikeda, Jiro, to Sony Corporation. Sputtering apparatus and system for sputtering employing same. 5,183,547, Cl. 204-298.250.
Ikeda, Tadashi: *See*—
Inagaki, Yoshio; and Ikeda, Tadashi, 5,183,733, Cl. 430-583.000.
Ikeda, Takayoshi: *See*—
Miwa, Takao; Ikeda, Takayoshi; Numata, Shunichi; Fujisaki, Koji; and Shimanoki, Hisae, 5,183,838, Cl. 524-109.000.
Ikeda, Yoshiaki, to Fanuc Ltd. Cooperative operation system for numberical control apparatus. 5,184,052, Cl. 318-569.000.
Ikeda, Yoshiharu; Kai, Yoshiyuki; and Ono, Keiichi, to Sumitomo Pharmaceuticals Company, Limited. Polyethylene glycol derivatives, their modified peptides, methods for producing them and use of the modified peptides. 5,183,660, Cl. 424-94.300.
Ikegami Tsushinki Co., Ltd.: *See*—
Yamamoto, Kazumi; and Sugasawa, Masayuki, 5,184,212, Cl. 358-39.000.
Ikejima, Hiroyuki: *See*—
Okuma, Shigeru; Furuhashi, Takeshi; Ikejima, Hiroyuki; and Ishii, Toshiaki, 5,183,980, Cl. 187-112.000.
Ikejiri, Fumitoshi: *See*—
Sakai, Hideki; Ishiwatari, Kazuo; and Ikejiri, Fumitoshi, 5,183,843, Cl. 524-318.000.
Ikeuchi, Masayuki: *See*—
Fukui, Wataru; Iwata, Toshio; Ohashi, Yutaka; and Ikeuchi, Masayuki, 5,182,943, Cl. 73-116.000.
Ikimi, Takashi: *See*—
Sakai, Keijiro; Endo, Tunehiro; Kuwota, Yuzuru; Ikimi, Takashi; Mutoh, Nobuyoshi; and Honbu, Mitsuyuki, 5,184,057, Cl. 318-803.000.
Ikumi, Tomonori: *See*—
Murakami, Kazunori; Ikumi, Tomonori; Matsumoto, Yasuo; and Iwafune, Yasuo, 5,184,245, Cl. 359-196.000.
Illinois Tool Works Inc.: *See*—
Barth, Gerald D., 5,183,359, Cl. 411-188.000.
Im, Jong H., to Goldstar Co., Ltd. Magnetron for a microwave oven having a pair of choke coils wound around a core in the same directions. 5,184,045, Cl. 315-39.510.
Imafuku, Tatsuo: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.
Image Acoustics, Inc.: *See*—
Butler, John L., 5,184,332, Cl. 367-162.000.
Imaseki, Takashi; Tamura, Minoru; Iwata, Toru; and Fukuyama, Yuichi, to Nissan Motor Company, Limited. Rear wheel steering system for vehicle. 5,184,298, Cl. 364-424.050.
Imoto, Toshiyuki: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.
Imperial Chemical Industries PLC: *See*—
Dukes, Michael, 5,183,814, Cl. 514-171.000.
Kenyon, Ronald W.; Newton, David F.; and Thorp, Derek, 5,183,888, Cl. 544-153.000.
Quan, Peter M.; and Leeming, Stephen W., 5,183,940, Cl. 564-370.000.
Inaba, Shigemitsu; and Matsumoto, Mitsuhiro, to Yazaki Corporation. Connector assembly. 5,183,410, Cl. 439-489.000.
Inada, Haruhiro; and Muramoto, Hisao, to Mazda Motor Corporation. Air bag device for automobile. 5,183,288, Cl. 280-732.000.
Inagaki, Yoshio; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 5,183,733, Cl. 430-583.000.

Inax Corporation: *See*—
Murata, Kazushige; and Ito, Takeshi, 5,183,668, Cl. 425-84.000.
Indiana Mills & Manufacturing, Inc.: *See*—
Anthony, James R.; and Wiseman, Michael A., 5,182,837, Cl. 24-642.000.
Industrial Technology Research Institute: *See*—
Tung, Fu-Ching; Chen, Chi-Tsun; and Lieu, Sheng-Feng, 5,182,898, Cl. 33-570.000.
Yan, Wen-Jyh, 5,182,921, Cl. 62-235.100.
Industrial Technology Research Instiute: *See*—
Liu, Ti Y.; Chen, Chi J.; and Chen, Shou H., 5,183,494, Cl. 75-349.000.
Ineichen, Kurt; Ruedi, Peter; and Wirth, Herbert, to Weber AG. Undervoltage tripping device. 5,184,101, Cl. 335-78.000.
Infant Advantage, Inc.: *See*—
Gatts, James D.; Buckley, Edward M.; and Jamieson, John W., 5,183,457, Cl. 600-21.000.
Ingersoll-Rand Company: *See*—
Urda, Paul, 5,183,441, Cl. 474-138.000.
Ingle, Lloyd D.; Peck, Leonard E., Jr.; and Santana, Jose A., to Santa Barbara Research Center. Flexible cable for interconnecting electronic components. 5,183,973, Cl. 174-254.000.
Ingram, Robert S.: *See*—
Fenton, Gary L.; Sill, Gerald A.; Ingram, Robert S.; and Jimenez, James G., 5,183,375, Cl. 410-35.000.
Inohana, Haruyuki; and Gomi, Shintaro, to Pioneer Electron Corporation. Differential amplifier. 5,184,086, Cl. 330-252.000.
Inoue, Osamu: *See*—
Kugimiya, Koichi; Sugaya, Yasuhiro; Inoue, Osamu; Satomi, Mitsuo; and Hirota, Ken, 5,183,631, Cl. 419-10.000.
Inoue, Yoshinori: *See*—
Konishi, Yasuhiro; Kumanoya, Masaki; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 5,184,321, Cl. 365-51.000.
Institut Dr. Friedrich Forster Pruferatebau: *See*—
Besendorfer, Herman; Stritzke, Gunter; and Haditsch, Franz, 5,184,070, Cl. 324-225.000.
Institut Francais de Petrole: *See*—
Regnault, Alain; Cretin, Jacques; and Froidevaux, Pascal, 5,184,329, Cl. 367-23.000.
Institut Pasteur: *See*—
Danchin, Antoine; Glaser, Philippe; Krin, Evelyne; Barzu, Octavien; Ladant, Daniel; and Ullmann, Agnes, 5,183,745, Cl. 435-69.100.
Instrumentarium Corporation: *See*—
Ehnholm, Gosta J., 5,184,076, Cl. 324-318.000.
Integrated Systems Engineering, Inc.: *See*—
Brown, Brent W., 5,184,114, Cl. 340-701.000.
Intel Corporation: *See*—
Ting, Chiu H.; and Pai, Pei-Lin, 5,183,795, Cl. 437-230.000.
International Business Machines: *See*—
Hakenewerth, Paul A.; Rohrer, Gene D.; and Stalberg, Nils G., 5,183,999, Cl. 235-379.000.
International Business Machines Corporation: *See*—
Ashelin, Brian T.; Bergquist, Mark A.; and Noltee, Dennis E., Sr., 5,184,284, Cl. 361-400.000.
Baratte, Herve; de Souza, Joel P.; and Sadana, Devendra K., 5,183,767, Cl. 437-11.000.
Gallagher, William J.; and Worthington, Thomas K., 5,183,970, Cl. 174-125.100.
Karidis, John P.; Reiley, Timothy C.; and Schein, Lawrence B., 5,184,183, Cl. 355-266.000.
Nagy, Michael E., 5,184,126, Cl. 341-67.000.
International Fuel Cells Corporation: *See*—
Kunz, Harold R., 5,183,713, Cl. 429-44.000.
International Medical, Inc.: *See*—
Wettermann, Peter H., 5,183,470, Cl. 604-281.000.
Interventional Thermodynamics, Inc.: *See*—
Dubrul, William R.; and Hillsman, Cecily M., 5,183,464, Cl. 128-3.000.
Inubushi, Akiyoshi: *See*—
Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, 5,183,716, Cl. 429-192.000.
Inuishi, masahide: *See*—
Mitsui, Katsuyoshi; and Inuishi, masahide, 5,183,771, Cl. 437-44.000.
Inujima, Takashi: *See*—
Yamazaki, Shunpei; Hayashi, Shigenori; Inujima, Takashi; and Hirose, Naoki, 5,183,511, Cl. 118-723.000.
Inukai, Hitoshi: *See*—
Fujii, Toshiro; Ikeda, Hayato; Katoh, Ryo; and Inukai, Hitoshi, 5,183,394, Cl. 417-269.000.
Isaacs, Stephen T.: *See*—
Hearst, David P.; Cimino, George D.; Hearst, John E.; and Isaacs, Stephen T., 5,184,020, Cl. 250-455.110.
Isaksson, Juhani, to A. Ahlstrom Corporation. Distributor plate in a fluidized bed reactor. 5,183,641, Cl. 422-143.000.
ISC Chemicals Limited: *See*—
Slinn, David S. L., 5,183,067, Cl. 134-61.000.
Isco, Inc.: *See*—
Fiedler, Robert R., 5,183,391, Cl. 417-118.000.
ISF Societa per Azioni: *See*—
Aliverti, Valerio; Dorigotti, Luciano; Fonio, Teodoro; and Pinza, Mario, 5,183,802, Cl. 514-2.000.
Ishibashi, Yukio: *See*—
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, 5,183,929, Cl. 560-178.000.
Ishida, Koichi: *See*—
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,183,824, Cl. 514-383.000.
Ishida, Roh, to Toyo Ink Mfg. Co., Ltd. Binarizing method for color image using modified error diffusion method. 5,184,213, Cl. 358-75.000.
Ishida, Satoshi: *See*—
Noguchi, Shigeru; Ishida, Satoshi; Iwata, Hiroshi; Sano, Keiichi; and Nakayama, Shoichiro, 5,183,780, Cl. 437-173.000.
Ishida, Yasuhiko; and Kondo, Katsuhiko, to Mitsubishi Denki K.K. Engine control apparatus including A/D converter failure detection element and method therefor. 5,184,302, Cl. 364-431.110.
Ishida, Yasushi: *See*—
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.
Ishida, Yoichi: *See*—
Fujii, Isao; Ajiki, Yoshio; Ishida, Yoichi; and Matsuura, Hiromi, 5,183,011, Cl. 123-1.00A.
Ishida, Yoshinori: *See*—
Mikami, Toshihiro; Kohmura, Yukio; Ishida, Yoshinori; and Nogami, Akira, 5,183,490, Cl. 65-144.000.
Ishigaki, Kouji: *See*—
Hayashi, Keisuke; Ishigaki, Kouji; Nakahara, Kazuyuki; Yanagida, Masato; and Kishi, Fumio, 5,184,184, Cl. 355-296.000.
Ishihara, Kazuya: *See*—
Onishi, Shigeo; Yamadai, Tsutomu; and Ishihara, Kazuya, 5,183,782, Cl. 437-192.000.
Ishii, Katsumi: *See*—
Asano, Takanobu; and Ishii, Katsumi, 5,183,378, Cl. 414-757.000.
Ishii, Kazuo: *See*—
Kato, Eiichi; and Ishii, Kazuo, 5,183,720, Cl. 430-96.000.
Kato, Eiichi; and Ishii, Kazuo, 5,183,721, Cl. 430-96.000.
Ishii, Masami: *See*—
Akahoshi, Sumihisa; Akimura, Hitoshi; Nakabayashi, Isao; Ishii, Masami; Ohi, Tamio; and Yoshida, Makoto, 5,183,591, Cl. 252-503.000.
Ishii, Masaru, to Kabushiki Kaisha Toshiba. Information processing device. 5,184,342, Cl. 369-100.000.
Ishii, Toshiaki: *See*—
Okuma, Shigeru; Furuhashi, Takeshi; Ikejima, Hiroyuki; and Ishii, Toshiaki, 5,183,980, Cl. 187-112.000.
Ishikawa, Youhei: *See*—
Wakino, Kikuo; Hishikawa, Toshio; Ishikawa, Youhei; Takehara, Koichi; and Tanizaki, Toru, 5,184,096, Cl. 333-175.000.
Ishikawajima-Harima Heavy Industries Co., Ltd.: *See*—
Uno, Nayomon; and Mutaguchi, Masao, 5,182,887, Cl. 52-167.00R.
Ishiwata, Soji: *See*—
Tanaka, Tsugutoshi; and Ishiwata, Soji, 5,184,149, Cl. 346-74.200.
Ishiwatari, Kazuo: *See*—
Sakai, Hideki; Ishiwatari, Kazuo; and Ikejiri, Fumitoshi, 5,183,843, Cl. 524-318.000.
Ishizuka, Masahiro; and Hayashi, Kazuyuki, to Mitsubishi Denki Kabushiki Kaisha. Method for converting elliptical to rectangular motion. 5,183,440, Cl. 474-101.000.
Isobe, Toshifumi: *See*—
Tanaka, Kazuyoshi; Isobe, Toshifumi; Itaya, Masahiko; and Naganuma, Akiko, 5,184,146, Cl. 346-1.100.
Isoishi, Kiyoshi: *See*—
Ueno, Shuji; Hagiwara, Michiaki; Mishima, Ryoji; and Isoishi, Kiyoshi, 5,183,515, Cl. 148-101.000.
Isono, Nobuyuki: *See*—
Goto, Shigeki; Shimei, Masato; Miyazawa, Tetsuhiro; Saitou, Yoshitami; and Isono, Nobuyuki, 5,182,970, Cl. 74-866.000.
Isoyama, Seiji: *See*—
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, 5,183,630, Cl. 419-31.000.
Isozaki, Shinichi: *See*—
Ariyama, Tatsuro; Isozaki, Shinichi; Yamada, Kenzo; Matsuo, Masahiro; and Kanatani, Genji, 5,183,495, Cl. 75-379.000.
ISP Investments Inc.: *See*—
Liu, Kou-Chang; and Taylor, Paul D., 5,183,946, Cl. 568-670.000.
Login, Robert B.; Merianos, John J.; Biss, Russell B.; and Garelick, Paul, 5,183,901, Cl. 548-543.000.
Israel, Howard: *See*—
Syrop, Steven B.; and Israel, Howard, 5,183,057, Cl. 128-845.000.
Itaya, Masahiko: *See*—
Tanaka, Kazuyoshi; Isobe, Toshifumi; Itaya, Masahiko; and Naganuma, Akiko, 5,184,146, Cl. 346-1.100.
ITO Co., Ltd.: *See*—
Toriu, Mamoru; and Kitamura, Mitsuru, 5,183,041, Cl. 128-421.000.
Ito, Hideaki; and Miyamoto, Masanori, to Yamaha Hatsudoki Kabushiki Kaisha. Two-cycle diesel engine. 5,183,013, Cl. 123-48.00R.
Ito, Katsuhiro: *See*—
Koyama, Toshiya; Matsumoto, Yukio; Yoshimoto, Hataaki; and Ito, Katsuhiro, 5,183,585, Cl. 252-299.010.
Ito, Kenji: *See*—
Saito, Osamu; Ito, Kenji; Moronaga, Kenji; and Watanabe, Mikio, 5,184,229, Cl. 358-427.000.

Ito, Koichi: *See*—
Tanaka, Hirokazu; and Ito, Koichi, 5,184,109, Cl. 340-455.000.
Ito, Masayoshi; Yamada, Kiichi; Otake, Katsunori; Miyata, Yasunobu; Narita, Tomohiro; and Nishikawa, Susumu, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Apparatus for controlling the output of a vehicle equipped with an internal combustion engine. 5,183,128, Cl. 180-197.000.
Ito, Shigehiro: *See*—
Nishi, Yuji; Ito, Shigehiro; Kuguchi, Tatsushi; and Ebihara, Kazuyuki, 5,184,221, Cl. 358-167.000.
Ito, Shinji: *See*—
Watanabe, Hisanori; and Ito, Shinji, 5,184,262, Cl. 360-96.200.
Ito, Takeshi: *See*—
Murata, Kazushige; and Ito, Takeshi, 5,183,668, Cl. 425-84.000.
Ito, Tosikazu: *See*—
Suita, Yoshihiro; and Ito, Tosikazu, 5,183,612, Cl. 264-145.000.
Itoh, Hiroaki: *See*—
Mitsui, Hidero; Kamaya, Naoki; Itoh, Hiroaki; and Sasaki, Yuu, 5,183,714, Cl. 429-123.000.
Itoh, Hiroyuki: *See*—
Masuda, Noboru; Kamikawai, Ryotaro; Yagyu, Masayoshi; Yamamoto, Masakazu; Itoh, Hiroyuki; and Saito, Tatsuya, 5,184,027, Cl. 307-269.000.
Itoh, Kenji; Iida, Akio; and Urasaki, Shuji, to Mitsubishi Denki Kabushiki Kaisha. Frequency synthesizer. 5,184,093, Cl. 331-25.000.
Itoh, Takaaki: *See*—
Tanaka, Yoshiyuki; and Itoh, Takaaki, 5,184,273, Cl. 361-120.000.
Iwafune, Yasuo: *See*—
Murakami, Kazunori; Ikumi, Tomonori; Matsumoto, Yasuo; and Iwafune, Yasuo, 5,184,245, Cl. 359-196.000.
Iwai, Fumio: *See*—
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, 5,184,166, Cl. 354-400.000.
Iwaki, Takashi: *See*—
Terada, Masahiro; Togano, Takeshi; Yamashita, Masataka; Iwaki, Takashi; Mori, Shosei; and Shinjo, Kenji, 5,183,586, Cl. 252-299.610.
Iwamoto, Akito: *See*—
Higuchi, Kazuhiko; Hirahara, Shuzo; Saito, Tutomu; Nagato, Hitoshi; and Iwamoto, Akito, 5,183,347, Cl. 400-583.300.
Iwamoto, Seiichi: *See*—
Ohmoto, Hiroshi; and Iwamoto, Seiichi, 5,183,755, Cl. 435-240.270.
Iwase, Yukio, to Prince Corporation. Apparatus for mounting and removing the supporting frame of a quilt or the like in sewing machines. 5,182,998, Cl. 112-117.000.
Iwata, Hiroshi: *See*—
Noguchi, Shigeru; Ishida, Satoshi; Iwata, Hiroshi; Sano, Keiichi; and Nakayama, Shoichiro, 5,183,780, Cl. 437-173.000.
Iwata, Ryuji: *See*—
Takahashi, Takehiko; Iwata, Ryuji; and Shimizu, Yuji, 5,183,315, Cl. 297-488.000.
Iwata, Toru: *See*—
Imaseki, Takashi; Tamura, Minoru; Iwata, Toru; and Fukuyama, Yuichi, 5,184,298, Cl. 364-424.050.
Iwata, Toshio: *See*—
Fukui, Wataru; Iwata, Toshio; Ohashi, Yutaka; and Ikeuchi, Masayuki, 5,182,943, Cl. 73-116.000.
Iwata, Yoichi: *See*—
Kuroda, Shigetaka; and Iwata, Yoichi, 5,182,907, Cl. 60-276.000.
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Yu, Jason, 5,183,411, Cl. 439-578.000.
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Pherigo, Douglas E., 5,183,171, Cl. 220-256.000.
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Dietl, Rudolf, 5,182,999, Cl. 112-178.000.
Jackovitz, John F.; Kunkle, Richard P.; and Peterson, Steven H., to Westinghouse Electric Corp. Apparatus and method for separating zirconium isotopes using balanced ion electromigration. 5,183,542, Cl. 204-180.100.
Jackovitz, John F.: *See*—
Snyder, Thomas S.; Jackovitz, John F.; and Ferrari, Harry M., 5,183,548, Cl. 204-299.00R.
Jacobs, David R.: *See*—
Hollander, Milton B.; Jacobs, David R.; and McKinley, William E., 5,183,420, Cl. 439-457.000.
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Jacobs, William A.; and Camp, William P., Jr., to Wooster Brush Company, The. Epoxy floor roller tool and method of making same. 5,182,840, Cl. 492-24.000.
Jacobson, Allan J.; Lai, Wen-Yih F.; Matturro, Michael G.; Deckman, Harry W.; McHenry, James A.; Reynolds, Robert P.; and Zhang, Qiyao, to Exxon Research and Engineering Company. Modular surface catalyzed membrane containing a microporous membrane catalyst layer and transport layer. 5,183,788, Cl. 502-4.000.
Jaehrling, Peter; and Schweikert, Eugen, to Siemens Aktiengesellschaft. Arrangement for transcutaneous filling or replenishment of liquid medications in an implantable medication dosing device. 5,183,472, Cl. 604-284.000.
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Warwel, Siegfried; Jagers, Hans-Gerd; and Deckers, Andreas, 5,183,791, Cl. 502-102.000.
Jakse, Frank P.; Morris, Donald E.; and Vanderlinde, William, to Monsanto Company. Process for the production of carbonate esters. 5,183,918, Cl. 558-271.000.
James M. Montgomery Engineers, Inc.: *See*—
Lang, John S.; Trussell, R. Rhodes; and Kawamura, Susumu, 5,183,335, Cl. 366-174.000.
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Gatts, James D.; Buckley, Edward M.; and Jamieson, John W., 5,183,457, Cl. 600-21.000.
Janese, Woodrow W. Cephalic expansion apparatus and the method of using to treat head injury. 5,183,058, Cl. 128-847.000.
Jansen, Johannes R.; and Littmann, Martin, to Bayer Aktiengesellschaft. Process for the racemization of optically active 1-aryl-alkylamines. 5,183,939, Cl. 564-302.000.
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Abe, Toshihiko, 5,183,049, Cl. 128-663.010.
Japan Immuno Research Laboratories Co., Ltd.: *See*—
Adachi, Masakazu; Saitou, Toshimitu; Murata, Kimiyo; and Tamura, Aki, 5,183,738, Cl. 435-7.100.
Japan Institute of Advanced Dentistry: *See*—
Masuhara, Eiichi; and Komiya, Shigeo, 5,183,403, Cl. 433-9.000.
Japan Steel Works, Ltd., The: *See*—
Yukihiro, Makoto; and Katagiri, Mamoru, 5,183,621, Cl. 264-297.200.
Jarlsson, Assai. Apparatus for limiting lateral movement in trailers. 5,183,283, Cl. 280-426.000.
Jarsch, Michael: *See*—
Kaluza, Klaus; Frey, Bruno; and Jarsch, Michael, 5,183,747, Cl. 435-91.000.
Jelic, Ralph, to Verosol USA Inc. Cording designs for operable arch window blind. 5,183,092, Cl. 160-84.100.
Jenuwine, William C.: *See*—
Bilge, Umit; Jurczyszyn, Christopher E.; and Jenuwine, William C., 5,183,992, Cl. 219-121.640.
Jeong, Tae-young: *See*—
Jin, Dae-je; Seo, Kwang-byeog; and Jeong, Tae-young, 5,183,772, Cl. 437-52.000.
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Collet, Erwin; Rathgeber, Roland; and Jerxsen, Udo, 5,182,869, Cl. 34-20.000.
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Hoffman, Ronald J.; Pillion, Lawrence M.; and Jewell, Paul L., 5,183,998, Cl. 219-492.000.
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Harada, Naoto; Sekine, Shuji; Furuya, Takeo; and Yoshioka, Nobuo, 5,184,050, Cl. 318-467.000.
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Fenton, Gary L.; Sill, Gerald A.; Ingram, Robert S.; and Jimenez, James G., 5,183,375, Cl. 410-35.000.
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Calabrese, Salvadore J.; Scarton, Henry A.; Murray, S. Frank; Ettles, Christopher M.; Kennedy, Warren C.; Dinc, Saim; Jlidi, Bessem; and Strong, William, 5,183,955, Cl. 84-437.000.
Jodlbauer, Heinz D., to A. Nattermann & Cie. GmbH Corporation of the Federal Republic of Germany. Baking agent for leavened dough. 5,183,680, Cl. 426-611.000.
Johann, Donald F.; and Burroughs, Alan C. Compensation for dust on an optical disk by increasing laser writing power. 5,184,343, Cl. 369-116.000.
Johansen, Brian: *See*—
Tarr, Leonard; King, Gregory; and Johansen, Brian, 5,184,179, Cl. 355-206.000.
Johnson, Dennis. Barrier system. 5,182,889, Cl. 52-298.000.
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Scheier, Donald J.; and Hathorn, Jack L., 5,183,434, Cl. 452-131.000.
Johnson, Frank J., to Amkor Electronics, Inc. Method of producing a strip of lead frames for integrated circuit dies in a continuous system. 5,183,724, Cl. 430-312.000.
Johnson, Joseph W.: *See*—
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Johnson, Mark R., to NutraSweet Company, The. Acetic acid recovery. 5,183,937, Cl. 562-608.000.
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Nguyen, My N.; Lee, Chee-Kong; and Herrington, Thomas L., 5,183,784, Cl. 501-19.000.
Johnson, Richard F.: *See*—
Mott, Stephen D.; and Johnson, Richard F., 5,183,683, Cl. 426-641.000.

Johnson, Ross E.: *See*—
Tury, Edward L.; Kaste, Keith; Johnson, Ross E.; and Danielson, David O., 5,184,017, Cl. 250-343.000.

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Decious, Gaylon; and Nesler, Clay, 5,184,122, Cl. 340-870.160.

Jokari/US., Inc.: *See*—
Wilhite, Gerald D., 5,183,227, Cl. 248-99.000.

Jolliff, Norman E., to Tecumseh Products Company. Transmission parking brake. 5,183,138, Cl. 192-4.00C.

Jones, Robert. Game target overlay for billiard table. 5,183,254, Cl. 273-14.000.

Jordan, David L.: *See*—
Edgell, James E.; and Jordan, David L., 5,183,331, Cl. 362-426.000.

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Jordan, Robert C.: *See*—
Duane, Diana C.; Zilley, Eric L.; and Jordan, Robert C., 5,183,972, Cl. 174-251.000.

Jordan, Scott C.; Wolf, Robert L.; Fleege, Dennis W.; and Sharp, Jeffrey O., to Square D Company. Lighting control and emergy management system. 5,184,278, Cl. 361-346.000.

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Jorstad, John L.; Morely, Richard A.; and Overbagh, William H., to Reynolds Metals Company. Engine block and cylinder liner assembly and method. 5,183,025, Cl. 123-669.000.

Joseph, Jose P.; and Madou, Marc J., to Commtech International Management Corporation. Multi-analyte sensing electrolytic cell. 5,183,549, Cl. 204-415.000.

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Carter, Charles G.; Jovancicevic, Vladimir; Hartman, Judith A.; and Kreh, Robert P., 5,183,590, Cl. 252-392.000.

Jukola, Bero; and Rebsamen, Werner, to Kustannusosakeyhtio Otava. Pre-assembled soft cover for a book, and method of making the same. 5,183,294, Cl. 281-23.000.

Julian, Vincent D. Waste management system. 5,183,293, Cl. 280-430.000.

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Bilge, Umit; Jurczyszyn, Christopher E.; and Jenuwine, William C., 5,183,992, Cl. 219-121.640.

Kaburagi, Chiharu: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Abe, Minoru; and Takano, Tetsuji, 5,183,141, Cl. 192-91.00A.

Kabushiki Kaisha Fuji Iryoki: *See*—
Yamasaki, Yoshikiyo; and Fujimoto, Shinichiro, 5,183,034, Cl. 128-36.000.

Kabushiki Kaisha Japan Health: *See*—
Yamasaki, Yoshikiyo; and Fujimoto, Shinichiro, 5,183,034, Cl. 128-36.000.

Kabushiki Kaisha Nittec: *See*—
Wakatake, Koichi, 5,183,638, Cl. 422-64.000.

Kabushiki Kaisha Okuma Tekkosho: *See*—
Fukaya, Yasushi, 5,184,294, Cl. 364-191.000.

Kabushiki Kaisha Topcon: *See*—
Nishio, Kouji; and Hanamura, Yoshihiko, 5,183,044, Cl. 128-648.000.

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Hayakawa, Shigeyuki; and Yanagisawa, Leiichi, 5,184,031, Cl. 307-296.300.
Higuchi, Kazuhiko; Hirahara, Shuzo; Saito, Tutomu; Nagato, Hitoshi; and Iwamoto, Akito, 5,183,347, Cl. 400-583.300.
Hirako, Keiichi; and Kawaguchi, Yoshihisa, 5,184,139, Cl. 342-354.000.
Iida, Tadasato; Takahashi, Fusakichi; Wada, Kouji; and Nigo, Toshiro, 5,182,915, Cl. 62-89.000.
Ishii, Masaru, 5,184,342, Cl. 369-100.000.
Kobayashi, Tadahiko; and Sahashi, Masashi, 5,184,037, Cl. 310-26.000.
Nakagawa, Tatsuya, 5,183,984, Cl. 219-10.55M.
Nozuyama, Yasuyuki, 5,184,067, Cl. 324-158.00R.
Oike, Hiroshi; and Kawamoto, Akira, 5,182,916, Cl. 62-135.000.
Saito, Keiichi; Kawamura, Shigeharu; Sato, Syozo; and Kawasumi, Kiyohito, 5,184,008, Cl. 250-214.0VT.
Saitoh, Kouji; and Uchida, Kazuyuki, 5,184,162, Cl. 324-158.00R.
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Aoki, Shinobu; Takagi, Haruo; and Okabe, Takanori, 5,184,201, Cl. 257-266.000.
Fujii, Toshiro; Ikeda, Hayato; Katoh, Ryo; and Inukai, Hitoshi, 5,183,394, Cl. 417-269.000.

Kachi, Kenjiro; and Noda, Kazuo, to Nippon Conlux Co., Ltd. Method and apparatus for recording and reproducing information on an optical medium. 5,184,340, Cl. 369-44.370.

Kadner, Martin: *See*—
Brandau, Egbert; Huschka, Hans; Kadner, Martin; and Schroder, Waldemar, 5,183,493, Cl. 75-335.000.

Kado, Syuji; Tatematsu, Susumu; and Ikari, Hideyuki, to Hoshizaki Denki Kabushiki Kaisha. Food service counter of the ice storage type. 5,182,917, Cl. 62-137.000.

Kadota, Michio; and Morozumi, Kazuhiko, to Murata Manufacturing Co., Ltd. Surface wave device. 5,184,042, Cl. 310-313.00A.

Kadowaki, Nobuo: *See*—
Nakamura, Masanori; Hirakouchi, Hiroshi; Yatsuka, Takeshi; Kadowaki, Nobuo; and Endoh, Hiroshi, 5,183,863, Cl. 525-438.000.

Kagawa, Rihito: *See*—
Nakajima, Shin; Aoyama, Hiroyuki; Kagawa, Rihito; and Shimoe, Osamu, 5,184,085, Cl. 328-65.000.

Kageyama, Fumio; Kanazawa, Hirotaka; Takahara, Shin; and Morita, Toshiki, to Mazda Motor Corporation. Suspension-traction total control system. 5,183,127, Cl. 180-197.000.

Kageyama, Yukihiko: *See*—
Kanaka, Keiichi; Hayashi, Noriyuki; Kobashi, Toshihiro; Kageyama, Yukihiko; and Hijikata, Kenji, 5,183,878, Cl. 528-193.000.

Kahishiki Kaisha Toshiba: *See*—
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Kai, Hiroyuki: *See*—
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Kai, Yoshiyuki: *See*—
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Kaifu, Noriyuki: *See*—
Saika, Toshihiro; Kobayashi, Isao; Kaifu, Noriyuki; and Endo, Tadao, 5,184,007, Cl. 250-208.100.

Kajikawa, Saburou: *See*—
Yamaguchi, Seiji; Moro, Masaru; Kajikawa, Saburou; Kimura, Masahiro; Okubo, Hideo; Matsuyo, Tadashi; and Kawakami, Hiroshi, 5,182,833, Cl. 15-319.000.

Kajikawa, Tsuneo: *See*—
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Kakushima, Masatoshi: *See*—
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,183,808, Cl. 514-33.000.

Kalman, Miklos: *See*—
Simoncsits, Andras; Kalman, Miklos; Kari, Csaba; and Cserpan, Imre, 5,183,748, Cl. 455-91.000.

Kaluza, Klaus; Frey, Bruno; and Jarsch, Michael, to Boehringer Mannheim GmbH. Type II restriction endonuclease Ssp4800I. 5,183,747, Cl. 435-91.000.

Kamaya, Naoki: *See*—
Mitsui, Hidero; Kamaya, Naoki; Itoh, Hiroaki; and Sasaki, Yuu, 5,183,714, Cl. 429-123.000.

Kamen, Melvin E., to Revlon Consumer Products Corporation. Lipstick dispenser formed with lipstick formulation. 5,183,349, Cl. 401-88.000.

Kameyama, Fumio: *See*—
Maruo, Satoshi; Hattori, Chikamasa; and Kameyama, Fumio, 5,184,053, Cl. 318-571.000.

Kameyama, Shuichi; Shimomura, Hiroshi; and Kikuchi, Kazuya, to Matsushita Electric Industrial Co., Ltd. Method of fabricating semiconductor device by forming doped regions that limit width of the base. 5,183,768, Cl. 437-26.000.

Kamikawai, Ryotaro: *See*—
Masuda, Noboru; Kamikawai, Ryotaro; Yagyu, Masayoshi; Yamamoto, Masakazu; Itoh, Hiroyuki; and Saito, Tatsuya, 5,184,027, Cl. 307-269.000.

Kamishiro, Toshiro: *See*—
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Kamyr, Inc.: *See*—
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor L.; Greenwood, Brian; Bain, Ronald; and Weston, John, 5,183,536, Cl. 162-57.000.

Kanai, Yasushi; Takano, Hiroe; Saoshita, Shushi; and Nitta, Atsumi, to Alps Electric Co., Ltd. Metal-in-gap head with double metal layer. 5,184,266, Cl. 360-120.000.

Kanaka, Keiichi; Hayashi, Noriyuki; Kobashi, Toshihiro; Kageyama, Yukihiko; and Hijikata, Kenji, to Polyplastics Co., Ltd. Easily processable, wholly aromatic polyester. 5,183,878, Cl. 528-193.000.

Kanamori, Tatsuru: *See*—
Miyauchi, Yuji; Yoshii, Shinichi; and Kanamori, Tatsuru, 5,184,252, Cl. 359-715.000.

Kanatani, Genji: *See*—
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Kanazawa, Hirotaka: *See*—
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Kanda, Masahiro: *See*—
Yumoto, Toshiyuki; Ohsono, Kouhei; Kanda, Masahiro; and Matsuda, Takahiro, 5,183,439, Cl. 474-28.000.

Kanebo, Ltd.: *See*—
Ohmoto, Hiroshi; and Iwamoto, Seiichi, 5,183,755, Cl. 435-240.270.

Kaneda, Aizo: *See*—
Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.

Kaneda, Takashi; and Villwock, Thomas, to MIPS Co., Ltd.; and Dataline Technologies GmbH. IC card adapter. 5,184,282, Cl. 361-395.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Masuhra, Shohei; Tonoki, Satoshi; Shibukawa, Toshiya; and Sugawara, Hirsohi, 5,183,695, Cl. 428-151.000.

Kaneko, Masahiro; Takemura, Masashi; and Yamashita, Kohei, to Victor Company of Japan, Ltd. Playback apparatus for playing back video information recorded on magnetic tape and providing smooth-frame still or slow motion video. 5,184,254, Cl. 360-10.200.

Kanemoto, Akihiko: *See*—
Iimura, Haruo; Takiguchi, Yasuyuki; and Kanemoto, Akihiko, 5,184,237, Cl. 359-63.000.

Kanki, Ichiro: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.

Kanner, Rowland W.: *See*—
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Kansky, John: *See*—
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Kao Corporation: *See*—
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,183,824, Cl. 514-383.000.
Jisai, Yasuhiro; Tanaka, Yukiomi; and Shigeta, Akira, 5,183,601, Cl. 252-524.000.
Nishide, Tsutomu; Yasumura, Daisuke; Nakajima, Yoshinobu; Onodera, Akiko; Yasukawa, Takuji; Kokumai, Hirokazu; Umeda, Tomoshige; Nomura, Seiji; and Mori, Hideki, 5,183,750, Cl. 435-134.000.

Kao, Jack: *See*—
Lee, Larry; and Kao, Jack, 5,182,872, Cl. 40-152.000.

Kapmeyer, Wolfgang, to Behringwerke Aktiengesellschaft. Dispersion polymers, processes for their preparation and their use. 5,183,766, Cl. 436-533.000.

Kari, Csaba: *See*—
Simoncsits, Andras; Kalman, Miklos; Kari, Csaba; and Cserpan, Imre, 5,183,748, Cl. 455-91.000.

Karidis, John P.; Reiley, Timothy C.; and Schein, Lawrence B., to International Business Machines, Corporation. Apparatus for printing grey scale images. 5,184,183, Cl. 355-266.000.

Karinen, Pertti: *See*—
Lehtomaki, Ilkka; Karinen, Pertti; Bergelin, Risto; and Myllymaki, Olavi, 5,183,677, Cl. 426-436.000.

Karius, Klaus D.; Eskam, Armin; and Vogt, Karl-Heinz, to Rheinmetall GmbH. Submunition for a spin stabilized carrier projectile. 5,183,962, Cl. 102-489.000.

Karls, Dieter, to Filterwerk Mann & Hummel GmbH. Apparatus for drying bulk materials. 5,182,871, Cl. 34-54.000.

Kashihara, Osamu, to Polyplastics Co., Ltd. Impact resistant moldable polyacetal resin compositions and processes for making same. 5,183,860, Cl. 525-398.000.

Kasmer, Christopher A.: *See*—
Zakheim, Howard; Clinton, Peter M.; Goldschneider, James D.; Kasmer, Christopher A.; Zahn, Markus; and Hoffmeyer, Charles L., 5,183,214, Cl. 241-30.000.

Kaste, Keith: *See*—
Tury, Edward L.; Kaste, Keith; Johnson, Ross E.; and Danielson, David O., 5,184,017, Cl. 250-343.000.

Kasuga, Tomoyuki: *See*—
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Katagiri, Mamoru: *See*—
Yukihiro, Makoto; and Katagiri, Mamoru, 5,183,621, Cl. 264-297.200.

Katakura, Takahiro: *See*—
Yonekubo, Shuji; Kitahara, Tsuyoshi; Furuta, Tatsuo; Katakura, Takahiro; and Serizawa, Naomi, 5,184,155, Cl. 346-140.00R.

Katayama, Akira: *See*—
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Katayama, Masatake: *See*—
Ohta, Yutaka; Ohki, Konomu; and Katayama, Masatake, 5,183,783, Cl. 437-225.000.

Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 5,183,720, Cl. 430-96.000.

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Kato, Hiroyuki, to Brother Kogyo Kabushiki Kaisha. Printer having tractor unit attachable to one of upstream and downstream sides of platen. 5,183,348, Cl. 400-616.200.

Kato, Mitsuo: *See*—
Yoshizawa, Yasuo; and Kato, Mitsuo, 5,182,967, Cl. 74-834.000.

Kato, Seinosuke: *See*—
Miyamoto, Yoshiaki; Sasaki, Teruo; Fujisawa, Kazuhiro; and Kato, Seinosuke, 5,182,888, Cl. 52-167.0DF.

Kato, Takahiro: *See*—
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.

Kato, Tohru: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; Yamamoto, Koichi; and Kato, Tohru, 5,183,637, Cl. 420-479.000.

Katoh, Ryo: *See*—
Fujii, Toshiro; Ikeda, Hayato; Katoh, Ryo; and Inukai, Hitoshi, 5,183,394, Cl. 417-269.000.

Katsuyama, Harumi: *See*—
Arai, Fuminori; and Katsuyama, Harumi, 5,183,741, Cl. 435-14.000.

Kawagoe, Takahiro: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.

Kawaguchi, Yoshihisa: *See*—
Hirako, Keiichi; and Kawaguchi, Yoshihisa, 5,184,139, Cl. 342-354.000.

Kawaguichi, Kuniaki; Nakane, Toshio; Shimoda, Akihide; and Hijikata, Kenji, to Polyplastics Co., Ltd. Process for producing transparent and heat-resistant polyester containers. 5,183,623, Cl. 264-544.000.

Kawai, Michiki; and Miyazaki, Takeo, to Daiwa Seiko, Inc. Fishing reel. 5,183,221, Cl. 242-310.000.

Kawakami, Hiroshi: *See*—
Yamaguchi, Seiji; Moro, Masaru; Kajikawa, Saburou; Kimura, Masahiro; Okubo, Hideo; Matsuyo, Tadashi; and Kawakami, Hiroshi, 5,182,833, Cl. 15-319.000.

Kawakita, Koji: *See*—
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McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,183,895, Cl. 546-304.000.

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Kee, Howard L., 5,183,679, Cl. 426-479.000.

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Kellogg, James R.: *See*—
McCurry, Patrick W.; Kellogg, James R.; Boekelheide, Karl; Sexton, Kenneth D.; Ellison, George A.; and Hocker, Robert A., 5,184,025, Cl. 307-66.000.

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Tarr, Leonard; King, Gregory; and Johansen, Brian, 5,184,179, Cl. 355-206.000.

King, Philip N., to Hewlett-Packard Company. Driver circuit for circuit tester. 5,184,029, Cl. 307-270.000.

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Alten, Charles J.; Cuccio, John S., Jr.; Kington, Harry L.; and Fontana, James D., 5,183,270, Cl. 277-81.00R.

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Maeda, Kazuo; and Kinoshita, Koichi, 5,183,136, Cl. 188-73.440.

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Shizuno, Hisamitsu; Kisi, Hirosi; Saito, Hirosi; and Fujii, Makoto, 5,184,277, Cl. 361-321.000.

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Kitamura, Mitsuru: *See*—
Toriu, Mamoru; and Kitamura, Mitsuru, 5,183,041, Cl. 128-421.000.

Kitamura, Takashi: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.

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Yasumura, Takaaki; Kiyomiya, Teruo; Mizuno, Yasutoshi; and Matsui, Kazuo, 5,183,517, Cl. 148-303.000.

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Erdman, Arthur G.; Rekow, Elizabeth D.; Riley, Donald R.; Klamecki, Barney; Zhu, Yang; and Ahn, Jeong-Ho, 5,184,306, Cl. 364-474.050.

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Wanninger, Paul; Wild, Richard; Kleinschmidt, Ernst; and Spath, Helmut, 5,183,520, Cl. 149-19.910.

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Twigg, Ray G.; Klug, Mark W.; Marrone, Santino; and Hawkes, Malcolm V., 5,184,068, Cl. 324-158.00F.

Kluth, Joachim: *See*—
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,183,932, Cl. 560-330.000.

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Knez, John S., Jr., 5,183,213, Cl. 241-24.000.

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Bremer, Wolfgang; Knoll, Peter; and Heintz, Frieder, 5,184,123, Cl. 340-995.000.

Knop, David G., to Dwyer Instruments, Inc. Flow switch assembly for fluid flow monitoring. 5,183,983, Cl. 200-81.90M.

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Allread, Alan R.; Chichester, Dennis B.; Rogers, Russell L.; and Knowles, Steven M., 5,182,922, Cl. 62-239.000.

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Kershaw, John K.; and McCray, Philip C., 5,183,118, Cl. 171-16.000.

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Saika, Toshihiro; Kobayashi, Isao; Kaifu, Noriyuki; and Endo, Tadao, 5,184,007, Cl. 250-208.100.

Kobayashi, Makoto: *See*—
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.

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Boutet, John C.; and Kocher, Thomas E., 5,184,013, Cl. 250-236.000.

Koda, Takao: *See*—
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, 5,184,166, Cl. 354-400.000.

Kodai, Shojiro; Ochi, Katsunori; and Baba, Fumiaki, to Mitsubishi Denki Kabushiki Kaisha. IC card and manufacturing method therefor. 5,184,209, Cl. 257-679.000.

Koestner, Ken: *See*—
Nappholz, Tibor A.; Koestner, Ken; and Valenta, Harry L., Jr., 5,183,040, Cl. 128-419.0PG.

Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, to Seiko Epson Corporation. Head positioning control for a spindle motor disk drive. 5,184,257, Cl. 360-77.050.

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Kohno, Mitunori: *See*—
Kurimoto, Yukuo; Fujii, Nobuhiko; Kohno, Mitunori; and Umebara, Takao, 5,183,135, Cl. 186-61.000.

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Morita, Shingo; and Koiwa, Mitsuru, 5,183,024, Cl. 123-598.000.

Kokumai, Hirokazu: *See*—
Nishide, Tsutomu; Yasumura, Daisuke; Nakajima, Yoshinobu; Onodera, Akiko; Yasukawa, Takuji; Kokumai, Hirokazu; Umeda, Tomoshige; Nomura, Seiji; and Mori, Hideki, 5,183,750, Cl. 435-134.000.

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Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.

Komatsu, Kazunori; and Tomaru, Mikio, to Fuji Photo Film Co., Ltd. Method for manufacturing magnetic recording media. 5,183,686, Cl. 427-549.000.

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Takemura, Yasuo; Narimatsu, Osamu; and Komatsu, Kazuyoshi, 5,183,699, Cl. 428-214.000.

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Komatsu, Takahiro: *See*—
Konishi, Yasuhiro; Kumanoya, Masaki; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 5,184,321, Cl. 365-51.000.

Kometani, Norio: *See*—
Nakamatsu, Toshio; Terao, Masanobu; Muneishi, Shigetoshi; Kometani, Norio; and Hayashi, Yoshiaki, 5,183,892, Cl. 546-76.000.

Kominato, Kaichiro: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.

Komiya, Shigeo: *See*—
Masuhara, Eiichi; and Komiya, Shigeo, 5,183,403, Cl. 433-9.000.

Komori Corporation: *See*—
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Kondo, Fumio, to Tokyo Automatic Machinery Works, Ltd. Screw feeder. 5,183,148, Cl. 198-674.000.

Kondo, Isao; and Taki, Yosio, to Seiko Epson Corporation. Parts assembling device. 5,182,850, Cl. 29-784.000.

Kondo, Katsuhiko: *See*—
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Sakata, Shinji; Miyashita, Takanori; Kondo, Kazuhiko; Sakai, Atsushi; Shibata, Toshiyuki; and Ogawa, Takayuki, 5,183,882, Cl. 514-49.000.

Kondo, Masaya: *See*—
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Gorlich, Karl J.; Bauer, Fritz U.; and Konetzka, Joerg, 5,183,834, Cl. 523-105.000.

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Haneda, Satoshi; Morita, Shizuo; Fukuchi, Masakazu; and Matsuo, Shunji, 5,184,187, Cl. 355-326.000.
Tanaka, Kazuyoshi; Isobe, Toshifumi; Itaya, Masahiko; and Naganuma, Akiko, 5,184,146, Cl. 346-1.100.
Yagi, Toshihiko, 5,183,730, Cl. 430-503.000.

Konig, Klaus: *See*—
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,183,932, Cl. 560-330.000.

Konishi, Sakuichi: *See*—
Kuwajima, Teruaki; Umeda, Shinichiro; and Konishi, Sakuichi, 5,183,504, Cl. 106-404.000.

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Poltorak, Jeffrey P.; and Swift, Omar A., 5,183,336, Cl. 366-273.000.

Kontron Instruments Holdings NV: *See*—
Burckhardt, Christoph B., 5,183,047, Cl. 128-661.090.

Kopp, Richard; Grogler, Gerhard; and Hess, Heinrich, to Bayer Aktiengesellschaft. Urea group-containing polyisocyanates modified with long chain compounds and a process for their preparation. 5,183,876, Cl. 528-59.000.

Korea Green Cross Corporation: *See*—
Lee, Ho W.; Riu, Sun J.; and An, Chang N., 5,183,658, Cl. 424-89.000.

Korpman, Ralph A.: *See*—
Bull, Brian S.; and Korpman, Ralph A., 5,184,188, Cl. 356-39.000.

Korsatko-Wabnegg, Brigitta; and Korsatko, Werner, to PCD Polymere Gesellschaft m.b.H. Pressing not delayed release of active compound, process for its production and use of polyhydroxybutyric acid for the production of such a pressing. 5,183,666, Cl. 424-464.000.

Korsatko, Werner: *See*—
Korsatko-Wabnegg, Brigitta; and Korsatko, Werner, 5,183,666, Cl. 424-464.000.

Korte, Thomas J.: *See*—
Elsasser, A. Frederick; and Korte, Thomas J., 5,183,908, Cl. 549-322.000.

Kosaka, Toru: *See*—
Iida, Yoshikazu; Kosaka, Toru; Tsuru, Hiroyuki; Higaki, Riichi; and Katayama, Akira, 5,184,167, Cl. 354-403.000.

Kosaku & Co., Ltd.: *See*—
Fukuoka, Kazuhiro; Kiyohara, Keiki; Konishi, Tadayuki; Miyatake, Isao; and Hamamoto, Masaji, 5,183,500, Cl. 106-1.220.

Kose, Junichi; Sugiyama, Akira; Yamada, Minoru; and Nozaki, Ryoei, to Fuji Photo Film Co., Ltd. Photosensitive material processor. 5,184,164, Cl. 354-298.000.

Koseki, Masaaki: *See*—
Kurosawa, Makoto; Koseki, Masaaki; Takahashi, Tetsuroh; and Terakado, Takeshi, 5,183,454, Cl. 493-459.000.

Koshida, Hitoshi: *See*—
Ohyama, Tsukasa; Shimokawa, Yasushi; Ghoda, Isamu; Takuma, Keisuke; and Koshida, Hitoshi, 5,183,474, Cl. 8-471.000.

Kotzian, Michael: *See*—
Schimmel, Gunther; Kotzian, Michael; and Gradl, Reinhard, 5,183,651, Cl. 423-334.000.

Koudelka, Vladimir, to Permon, statni podnik pan. Submersible pneumatic drilling unit. 5,183,121, Cl. 173-206.000.

Koupal, Lawrence: *See*—
Bills, Gerald F.; Hensens, Otto D.; Koupal, Lawrence; Lingham, Russell B.; Ondeyka, John G.; and Zink, Deborah L., 5,183,826, Cl. 514-411.000.

Kowa Company Limited: *See*—
Ichihashi, Tadashi; and Akiyama, Koichi, 5,184,157, Cl. 351-208.000.

Kowarik, Oskar: *See*—
Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, 5,184,326, Cl. 365-201.000.

Koyama, Toshiya; Matsumoto, Yukio; Yoshimoto, Hataaki; and Ito, Katsuhiro, to Ube Industries, Ltd. Liquid crystal emulsion composition. 5,183,585, Cl. 252-299.010.

Koyama, Yasufumi: *See*—
Kuwabara, Akira; and Koyama, Yasufumi, 5,184,313, Cl. 364-561.000.

Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, to Hitachi, Ltd.; Hitachi VLSI Engineering Corporation; and Link Laboratory Inc. Switching system. 5,184,346, Cl. 370-60.000.

Kraeutler, Bernard, to Nergeco (societe anonyme). Removable sealing device for a raisable-curtain industrial door. 5,183,093, Cl. 160-84.100.

Kraft, Longin, to Siemens Aktiengesellschaft. Motor/gear-train drive unit, particularly motor-vehicle power-window drive. 5,184,039, Cl. 310-89.000.

Kraidin, Jonathan; and Gratz, Irwin. Means and apparatus for continuously determining cardiac output in a subject. 5,183,051, Cl. 128-687.000.

Kramer, Andreas; Brunner, Rudolf; and Zahir, Abdul-Cader, to Ciba-Geigy Corporation. Hardenable compositions. 5,183,869, Cl. 526-262.000.

Kramer, Charles J., to Holotek Ltd. Adjustable fixed mount for a hologon deflector. 5,183,350, Cl. 403-4.000.

Kramer, James F. Force feedback and textures simulating interface device. 5,184,319, Cl. 364-806.000.

Kraus, Joseph S.; Lanzerotti, Louis J.; and Medford, Lester V., to AT&T Bell Laboratories. Method of operating an installation that comprises one or more long electrical conductors. 5,184,311, Cl. 364-354.010.

Kraus, Matthias H.; and Aaronson, Stuart A., to United States of America, America. DNA segment encoding a gene for a receptor related to the epidermal growth factor receptor. 5,183,884, Cl. 536-23.500.

Kraus, Rainer: *See*—
Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, 5,184,326, Cl. 365-201.000.

Kreh, Robert P.; and Henry, Wayne L., to W. R. Grace & Co.-Conn. Multipurpose scale preventer/remover. 5,183,573, Cl. 210-697.000.

Kreh, Robert P.: *See*—
Carter, Charles G.; Jovancicevic, Vladimir; Hartman, Judith A.; and Kreh, Robert P., 5,183,590, Cl. 252-392.000.
Hwa, Chih M.; Kelly, John A.; Tai, Wun T.; Fan, Lai-Duien G.; Kreh, Robert P.; and Greaves, Brian, 5,183,574, Cl. 210-701.000.

Kremer, Lawrence N.: *See*—
Roof, Glenn L.; and Kremer, Lawrence N., 5,183,560, Cl. 208-236.000.

Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., to Mobil Oil Corp. Demetallation of hydrocarbon feedstocks with a synthetic mesoporous crystalline material. 5,183,561, Cl. 208-251.00R.

Krin, Evelyne: *See*—
Danchin, Antoine; Glaser, Philippe; Krin, Evelyne; Barzu, Octavien; Ladant, Daniel; and Ullmann, Agnes, 5,183,745, Cl. 435-69.100.

Krishnan, Krishnaswamy, to Bio-Rad Laboratories, Inc. Sample table for multi-mode spectrum analysis. 5,184,191, Cl. 356-244.000.

Krone, John J.: *See*—
Devier, Lonnie J.; Krone, John J.; Lunzman, Stephen V.; and Marsden, Howard A., 5,182,908, Cl. 60-420.000.

Kryder, Mark H.; and Shieh, Han-Ping D., to Movid Information Technology, Inc. Method and system for erasing previously recorded domains in a magneto-optic recording medium. 5,184,335, Cl. 369-13.000.

Krysik, Joseph: *See*—
Reiterman, Lee; Martin, Dale D.; and Krysik, Joseph, 5,183,363, Cl. 408-59.000.

Kubota, Yasuhiko: *See*—
Mima, Hiroshi; Suzuki, Tadashi; and Kubota, Yasuhiko, 5,182,902, Cl. 57-279.000.

Kubota, Yuzuru: *See*—
Sakai, Keijiro; Endo, Tunehiro; Kubota, Yuzuru; Ikimi, Takashi; Mutoh, Nobuyoshi; and Honbu, Mitsuyuki, 5,184,057, Cl. 318-803.000.

Kuc, Victor D., to Triangle Engineered Products Co. Lubrication system for air compressor. 5,183,134, Cl. 184-6.160.

Kuebler, Christopher D. Pass-football. 5,183,263, Cl. 273-65.0EG.

Kugimiya, Koichi; Sugaya, Yasuhiro; Inoue, Osamu; Satomi, Mitsuo; and Hirota, Ken, to Matsushita Electric Industrial Co., Ltd. Composite material and a method for producing the same. 5,183,631, Cl. 419-10.000.

Kuguchi, Tatsushi: *See*—
Nishi, Yuji; Ito, Shigehiro; Kuguchi, Tatsushi; and Ebihara, Kazuyuki, 5,184,221, Cl. 358-167.000.

Kuhlman, Delmar A. Skimmer. 5,182,860, Cl. 30-325.000.

Kuhlmann, George E.: *See*—
Harper, Jon J.; Kuhlmann, George E.; Larson, Keith D.; McMahon, Rosemary F.; and Sanchez, Paul A., 5,183,933, Cl. 562-414.000.

Kulaga, Henrietta: *See*—
Kindt, Thomas J.; Kulaga, Henrietta; and Folks, Thomas M., 5,183,949, Cl. 800-2.000.

Kumanoya, Masaki: *See*—
Konishi, Yasuhiro; Kumanoya, Masaki; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 5,184,321, Cl. 365-51.000.

Kumar, Swadesh, to Ortho-Dent. Mobile hinge member and orthodontic appliance using it. 5,183,388, Cl. 433-19.000.

Kunkle, Richard P.: *See*—
Jackovitz, John F.; Kunkle, Richard P.; and Peterson, Steven H., 5,183,542, Cl. 204-180.100.

Kunz, Harold R., to International Fuel Cells Corporation. Carbon monoxide tolerant platinum-tantalum alloyed catalyst. 5,183,713, Cl. 429-44.000.

Kuo, Jause: *See*—
Landry, Christian C.; Kuo, Jause; Chen, Ching-Shi; and Wu, William, 5,183,321, Cl. 312-250.000.

Kupershmidt, Vladimir: *See*—
Black, Michael; and Kupershmidt, Vladimir, 5,184,156, Cl. 351-158.000.

Kupka, Dennis B.: *See*—
Berg, Ralph O.; Lang, Fred J., Jr.; and Kupka, Dennis B., 5,183,069, Cl. 137-15.000.

Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, to Mita Industrial Co., Ltd. Cartridge discriminating system. 5,184,181, Cl. 355-260.000.

Kurimoto, Yukuo; Fujii, Nobuhiko; Kohno, Mitunori; and Umebara, Takao, to Tokyo Electric Co., Ltd. Apparatus for inputting commodity data. 5,183,135, Cl. 186-61.000.

Kurita Water Industries Ltd.: *See*—
Totoki, Toshio; Shigemi, Hirotake; and Yasukawa, Yoshio, 5,183,562, Cl. 210-85.000.

Kuroda, Shigetaka; and Iwata, Yoichi, to Honda Giken Kogyo Kabushiki Kaisha. System for monitoring performance of HC sensors for internal combustion engines. 5,182,907, Cl. 60-276.000.

Kurokawa, Masahiro: *See*—
Honma, Akihiro; and Kurokawa, Masahiro, 5,183,539, Cl. 203-38.000.

Kurosawa, Makoto; Koseki, Masaaki; Takahashi, Tetsuroh; and Terakado, Takeshi, to Hitachi Koki Co., Ltd. Paper curl correction apparatus. 5,183,454, Cl. 493-459.000.

Kuroyama, Yutaka; Maeno, Masami; and Sakakibara, Ikuo, to Nippon Oil and Fats Co., Ltd. Cutting tool assembly. 5,183,362, Cl. 407-118.000.

Kusch, Hans-Jurgen: *See*—
D'Heureuse, Walter; Greive, Martin; Heppenstiel, Gerhard; and Kusch, Hans-Jurgen, 5,182,989, Cl. 101-148.000.

Kustannusosakeyhtio Otava: *See*—
Jukola, Bero; and Rebsamen, Werner, 5,183,294, Cl. 281-23.000.

Kuster, Heinz; and Kuster, Stephan, to Asten Group, Inc. Weave shed formation apparatus for end reweaving type joining apparatus. 5,183,081, Cl. 139-59.000.

Kuster, Stephan: *See*—
Kuster, Heinz; and Kuster, Stephan, 5,183,081, Cl. 139-59.000.

Kusterbeck, Anne W.: *See*—
Ligler, Frances S.; Gaber Bruce P.; Kusterbeck, Anne W.; and Wemhoff, Gregory A., 5,183,740, Cl. 435-7.320.

Kusuhara, Nobumi: *See*—
Miyahara, Shoichiro; Shindo, Atsunori; Suzuki, Maki; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,183,754, Cl. 435-226.000.

Kutsukake, Yusuke: *See*—
Fukushima, Hiroshi; Motonaga, Akira; Suda, Eriko; Nakajima, Mikito; Takeshita, Katsuyoshi; and Kutsukake, Yusuke, 5,183,870, Cl. 526-273.000.

Kuwabara, Akira; and Koyama, Yasufumi, to Dainippon Screen Mfg. Co., Ltd. Conversion device for laser interferometic measuring apparatus. 5,184,313, Cl. 364-561.000.

Kuwajima, Teruaki; Umeda, Shinichiro; and Konishi, Sakuichi, to Nippon Paint Co., Ltd. Aqueous coating composition. 5,183,504, Cl. 106-404.000.

Kuwatsuka, Toshiaki: *See*—
Utsunomiya, Atsushi; Nakamura, Mitsuo; Kuwatsuka, Toshiaki; and Tanaka, Yoshinori, 5,183,927, Cl. 560-115.000.

Kwak, Deog Y.: *See*—
Chung, Jin Y.; and Kwak, Deog Y., 5,184,030, Cl. 307-296.010.

Kyriacou, Andreas, to Paradigm Biotechnologies Partnership. Filtration apparatus and process. 5,183,569, Cl. 210-636.000.

L.A. Rumbold Limited: *See*—
Cunningham, Douglas J., 5,183,313, Cl. 297-344.000.

La Jolla Cancer Research Foundation: *See*—
Pfahl, Magnus; and Tzukerman, Maty, 5,183,736, Cl. 435-6.000.

Laboratories Knoll, S.A.: *See*—
Brana, Miguel F.; Sanz, Antonio M.; Alvarez-Ossorio, Rafael P.; Roldan, Cristobal M.; De Gamboa, Cristina R. F.; Garcia, Jesus G.; and Berlanga, Jose M. C., 5,183,821, Cl. 514-296.000.

Labovitz, Jeffrey; Guilford, William J.; Fang, Lawrence; and Liang, Yi, to Orsan; and Orsem. Method for the preparation of substituted 1,4-dihydro-4-oxo-cinnoline-3-carboxylic acid, esters and salts thereof, and intermediates used in their preparation. 5,183,891, Cl. 544-235.000.

Lackner, Anna M.: *See*—
Lim, Khoon C.; Margerum, J. David; Lackner, Anna M.; and Miller, Leroy J., 5,184,233, Cl. 359-46.000.

Lacroix, Michel, to Thomson-CSF. Device for the display of simulated images for helmets. 5,184,250, Cl. 359-631.000.

Ladant, Daniel: *See*—
Danchin, Antoine; Glaser, Philippe; Krin, Evelyne; Barzu, Octavien; Ladant, Daniel; and Ullmann, Agnes, 5,183,745, Cl. 435-69.100.

Ladwig, Gregory J., to Nicolet Instrument Corporation. Dynamically calibrated trigger for oscilloscopes. 5,184,062, Cl. 324-74.000.

Lafosse, Jean; and Milliere, Paul, to Telemecanique. Protective casing for electric distribution busbars. 5,183,971, Cl. 174-138.00F.

Lai, Chron-Si, to Hershey Foods. Low moisture hot rolling process and product. 5,183,682, Cl. 426-636.000.

Lai, Wen-Yih F.: *See*—
Jacobson, Allan J.; Lai, Wen-Yih F.; Matturro, Michael G.; Deckman, Harry W.; McHenry, James A.; Reynolds, Robert P.; and Zhang, Qiyao, 5,183,788, Cl. 502-4.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., 5,184,315, Cl. 364-709.160.

Lakomaa, Eeva-Liisa: *See*—
Knuuttila, Hilkka; and Lakomaa, Eeva-Liisa, 5,183,794, Cl. 502-242.000.
Knuuttila, Pekka; and Lakomaa, Eeva-Liisa, 5,183,796, Cl. 502-340.000.

Lampson, Robin A.: *See*—
Haun, Robert E.; Elmer, Neil C.; and Lampson, Robin A., 5,183,498, Cl. 75-709.000.

Lanctot, Paul A. Hockey stick. 5,183,264, Cl. 273-67.00A.

Landis, Michael E.: *See*—
Degnan, Thomas F., Jr.; Keville, Kathleen M.; Landis, Michael E.; Marler, David O.; and Mazzone, Dominick N., 5,183,557, Cl. 208-111.000.
Kirker, Garry W.; Degnan, Thomas F., Jr.; Huss, Albin, Jr.; and Landis, Michael E., 5,183,559, Cl. 208-119.000.
Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., 5,183,561, Cl. 208-251.00R.

Landry, Christian C.; Kuo, Jause; Chen, Ching-Shi; and Wu, William. Hand brake mechanism for a central processing unit cabinet. 5,183,321, Cl. 312-250.000.

Lang, Fred J., Jr.: *See*—
Berg, Ralph O.; Lang, Fred J., Jr.; and Kupka, Dennis B., 5,183,069, Cl. 137-15.000.

Lang, John S.; Trussell, R. Rhodes; and Kawamura, Susumu, to James M. Montgomery Engineers, Inc. Hydraulic jet flash mixer with flow deflector. 5,183,335, Cl. 366-174.000.

Langhoff, Peter W.: *See*—
Parker, Robin Z.; and Langhoff, Peter W., 5,182,912, Cl. 60-641.800.

Langhorst, Martin A.; and Henry, Joseph B., to Dow Chemical Company, The. Size separation of particles contained within a material by the use of nonaqueous hydrodynamic chromatography. 5,183,604, Cl. 264-40.100.

Langouet, Luc, to Vilter Manufacturing Corporation. Compressor slide valve control. 5,183,395, Cl. 417-310.000.

Lanzerotti, Louis J.: *See*—
Kraus, Joseph S.; Lanzerotti, Louis J.; and Medford, Lester V., 5,184,311, Cl. 364-554.010.

LaPalomento, Joseph. Universal fixture support. 5,183,233, Cl. 248-343.000.

Lapeyre, James M., to Laitram Corporation, The. Comprehensive computer data and control entries from very few keys operable in a fast touch typing mode. 5,184,315, Cl. 364-709.160.

LaPonsey, Stephen M.: *See*—
Kline, John F.; Pensavecchia, Frank G.; LaPonsey, Stephen M.; and Williams, Richard A., 5,182,990, Cl. 101-211.000.

Larner, Joseph: *See*—
Kennington, Alison S.; and Larner, Joseph, 5,183,764, Cl. 436-131.000.

Larsen, Mark A.: *See*—
Berge, Richard H., Jr.; and Larsen, Mark A., 5,182,880, Cl. 49-504.000.

Larson, Keith D.: *See*—
Harper, Jon J.; Kuhlmann, George E.; Larson, Keith D.; McMahon, Rosemary F.; and Sanchez, Paul A., 5,183,933, Cl. 562-414.000.

Latchinian, Gerard; Latchinian, Ramy; and Camper, Franklin, to Ramy Systems, Inc. Automated cashier system. 5,183,142, Cl. 194-206.000.

Latchinian, Ramy: *See*—
Latchinian, Gerard; Latchinian, Ramy; and Camper, Franklin, 5,183,142, Cl. 194-206.000.

Latella, Alfonso: *See*—
Beaufils, Stephen C.; and Latella, Alfonso, 5,183,963, Cl. 102-515.000.

Lauf, Robert J.; Holcombe, Cressie E.; and Dykes, Norman L., to Martin Marietta Energy Systems, Inc. Process for manufacturing tantalum capacitors. 5,184,286, Cl. 361-529.000.

Lawless, William N. Ceramic superconducting downlead. 5,183,965, Cl. 174-15.500.

Lax, Ronald G.: *See*—
Ringle, Larry L.; and Lax, Ronald G., 5,183,063, Cl. 132-321.000.

Laycock SA: *See*—
Dragicevic, Zoran, 5,183,578, Cl. 210-773.000.

Layman, Curtis M.: *See*—
Malito, John T.; and Layman, Curtis M., 5,183,211, Cl. 241-16.000.

Lazaro, Luis J., Jr.; and Harsch, Franklin D., to Boeing Company, The. Modular, circular, environment resistant electrical connector assembly having retention clips for manually or automatically loading of electrical contacts. 5,183,413, Cl. 439-589.000.

Leach, Jerald G., to Texas Instruments Incorporated. Glitch reduction in integrated circuits, systems and methods. 5,184,032, Cl. 307-443.000.

Leaney, Peter A.; and Smith, Robert J., to Baroid Technology, Inc. Down-hole decelerators. 5,183,113, Cl. 166-316.000.

Lee, Albert H., Jr.; and Sabo, Carl H., to Gates Rubber Company, The. Inflatable packer. 5,183,108, Cl. 166-187.000.

Lee, Bang-Wan; and Bae, Yl-Sung, to Samsung Electronics Co., Ltd. Voltage regulator for generating a constant reference voltage which does not change over time or with change in temperature. 5,184,061, Cl. 323-265.000.

Lee, Chee-Kong: *See*—
Nguyen, My N.; Lee, Chee-Kong; and Herrington, Thomas L., 5,183,784, Cl. 501-19.000.

Lee, Ching-Pang; Rieck, Harold P., Jr.; Palmer, Nicholas C.; and Fargher, David G. W., to General Electric Company. Turbine blade squealer tip having air cooling holes contiguous with tip interior wall surface. 5,183,385, Cl. 416-97.00R.

Lee, Fu M.: *See*—
Scoggins, Lacey E.; Lee, Fu M.; Chang, Allen T.; and Perkins, Wiley D., 5,183,538, Cl. 203-28.000.

Lee, Gary C. M.; Garst, Michael E.; and Sachs, George, to Allergan, Inc. 2- and 5-alkyl and phenyl substituted 4-(1-hydroxy, 1-acyloxy or 1-carbamoyloxy)-5-hydroxy-2 (5H)-furanones as anti-inflammatory agents. 5,183,906, Cl. 549-218.000.

Lee, Ho W.; Riu, Sun J.; and An, Chang N., to Korea Green Cross Corporation. Hantaan virus strain ROK84/105 and vaccine therefor. 5,183,658, Cl. 424-89.000.

Lee, Jhang W., to Texas Instruments Incorporated. Heteroepitaxy by growth of thermally strained homojunction superlattice buffer layers. 5,183,776, Cl. 437-110.000.

Lee, Jin S.; and Blick, Mark, to Board of Regents, The University of Texas System. Bioactive EGF peptides for promotion of tissue regeneration and cancer therapy. 5,183,805, Cl. 514-13.000.

Lee, Larry; and Kao, Jack. Sound producing control switch for a picture-frame. 5,182,872, Cl. 40-152.000.

Lee, Steve: *See*—
Bruckner, Raimund; Hintzen, Ullrich; Lee, Steve; Schuler, Andreas; and Wiesel, Martin, 5,183,624, Cl. 266-236.000.

Leeming, Stephen W.: *See*—
Quan, Peter M.; and Leeming, Stephen W., 5,183,940, Cl. 564-370.000.

LeFebre, David A., to Guided Wave. Dual fiber optic spectrophotometer. 5,184,193, Cl. 356-325.000.

Lefferts, Johannes, to Siteg Siebtechnik GmbH. Double helix, method of making same and spiral link belt made therefrom. 5,183,442, Cl. 474-239.000.

Legal, Jules O.: *See*—
Roy, Orest Z.; Fulford, Raymond E.; and Legal, Jules O., 5,183,133, Cl. 180-252.000.

Le Gauyer, Philippe, to Valeo Thermique Moteur. Tubular manifold for a heat exchanger and a method of making it. 5,183,107, Cl. 165-176.000.

Lehman, Dexter: *See*—
Wright, William R.; and Lehman, Dexter, 5,182,834, Cl. 15-330.000.

Lehmann, Richard W., to Zimpro Passavant Environmental Systems, Inc. Process for treatment of wastewater containing inorganic ammonium salts. 5,183,577, Cl. 210-761.000.

Lehtomaki, Ilkka; Karinen, Pertti; Bergelin, Risto; and Myllymaki, Olavi, to Oy Alko AB. Beta-glucane enriched alimentary fiber. 5,183,677, Cl. 426-436.000.

Leininger, Volker: *See*—
Schweiker, Werner; and Leininger, Volker, 5,184,051, Cl. 318-568.000.

Leiter, Berndt, to Fichtel & Sachs AG. Actuating force transmission unit for a gear change mechanism of a bicycle. 5,182,962, Cl. 74-473.00R.

Lemaire, Marc: *See*—
Foos, Jacques; Lemaire, Marc; Guy, Alain; Guyon, Vincent; Chomel, Rodolphe; Deloge, Andre ; Doutreluigne, Pierre; and Le Roy, Henri, 5,183,645, Cl. 423-8.000.

Lenglet, Eric, to Procedes Petroliers et Petrochimiques, a part interest. Installation for steam cracking hydrocarbons, with solid erosive particles being recycled. 5,183,642, Cl. 422-213.000.

Leonardi, David. Eye shield retention system. 5,183,059, Cl. 128-858.000.

Leonowicz, Michael E.: *See*—
Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., 5,183,561, Cl. 208-251.00R.

Lepori, Agostino; and Camaioni, Domenico, to Presidenza del Consiglio dei Ministri - Ufficio del Ministro per il coordinamento delle Iniziativae per la Ricerca Scientifica e Tecnologica. Process for binding cellulosic materials with a binding agent of an aqueous emulsions of polyisocyanates and cellulose ether. 5,183,837, Cl. 524-13.000.

Leppek, Kevin G.: *See*—
Hogan, Martin A.; Leppek, Kevin G.; and Spadafora, Peter J., 5,184,299, Cl. 364-426.020.

Lequime, Michel, to Bertin & Cie. Spectrum modulation encoding sensor system for remotely detecting a physical magnitude, and operating by reflection. 5,184,010, Cl. 250-227.210.

Lerke, Charles J. Map reading game apparatus. 5,183,258, Cl. 273-252.000.

Le Roy, Henri: *See*—
Foos, Jacques; Lemaire, Marc; Guy, Alain; Guyon, Vincent; Chomel, Rodolphe; Deloge, Andre ; Doutreluigne, Pierre; and Le Roy, Henri, 5,183,645, Cl. 423-8.000.

Lescovich, Joseph E., to G A Industries, Inc. Self-cleaning strainer. 5,183,568, Cl. 210-360.100.

L'Etat Francais represente par le Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications): *See*—
Levionnais, Philippe, 5,184,001, Cl. 235-449.000.

Lever Brothers Company, Division of Conopco Inc.: *See*—
Lew, Jeanie; and Bory, Barbara H., 5,183,580, Cl. 252-8.600.

Levinthal, Adam: *See*—
Molpus, J. Lane; Levinthal, Adam; and Werner, Ross, 5,184,124, Cl. 341-50.000.

Levionnais, Philippe, to L'Etat Francais represente par le Ministre des Postes, des Telecommunications et de l'Espace (Centre National d'Etudes des Telecommunications). System for remote information interchange between a portable object and a station. 5,184,001, Cl. 235-449.000.

Leviton Manufacturing Company, Inc.: *See*—
Doyle, Richard C.; and Rivera, Lester, 5,184,271, Cl. 361-49.000.

Levy, Karl B., to Applied Materials, Inc. Method for forming capacitor in trench of semiconductor wafer by implantation of trench surfaces with oxygen. 5,183,775, Cl. 437-60.000.

Levy, Steven L.: *See*—
Kelly, Wayne T.; and Levy, Steven L., 5,183,204, Cl. 236-94.000.

Lew, Jeanie; and Bory, Barbara H., to Lever Brothers Company, Division of Conopco Inc. Liquid fabric conditioner containing fabric softener and green colorant. 5,183,580, Cl. 252-8.600.

Lew, Thomas M.: *See*—
Rai, Kula R.; Lew, Thomas M.; and Sinclair, Robert B., 5,184,190, Cl. 356-239.000.

Lewis, Charles W.: *See*—
Hull, Charles W.; Spence, Stuart T.; Albert, David J.; Smalley, Dennis R.; Harlow, Richard A.; Stinebaugh, Phil; Tarnoff, Harry L.; Nguyen, Hop D.; Lewis, Charles W.; Vorgitch, Tom J.; and Remba, David Z., 5,184,307, Cl. 364-474.240.

Lewis, Earl L. Balanced jigging lure. 5,182,876, Cl. 43-42.390.

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Lotz, Hans-Georg, 5,183,997, Cl. 219-464.000.

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Labovitz, Jeffrey; Guilford, William J.; Fang, Lawrence; and Liang, Yi, 5,183,891, Cl. 544-235.000.

Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., to Life Resonances, Inc. Method and apparatus for the treatment of cancer. 5,183,456, Cl. 600-9.000.

Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 5,183,380, Cl. 414-795.800.

Lieu, Sheng-Feng: *See*—
Tung, Fu-Ching; Chen, Chi-Tsun; and Lieu, Sheng-Feng, 5,182,898, Cl. 53-570.000.

Life Resonances, Inc.: *See*—
Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., 5,183,456, Cl. 600-9.000.

Ligler, Frances S.; Gaber Bruce P.; Kusterbeck, Anne W.; and Wemhoff, Gregory A., to United States of America, Navy. Flow immunosensor method and apparatus. 5,183,740, Cl. 435-7.320.

Lily Cups, Inc.: *See*—
Boller, Peter K., 5,183,172, Cl. 220-270.000.

Lim, Jong H. Electric power generators having like numbers of magnets and coils. 5,184,040, Cl. 310-114.000.

Lim, Khoon C.; Margerum, J. David; Lackner, Anna M.; and Miller, Leroy J., to Hughes Aircraft Company. Liquid crystal-based composite material including electrically conducting elongated particles and having enhanced microwave birefringence. 5,184,233, Cl. 359-46.000.

Lin, Mao S. Junction box. 5,183,967, Cl. 174-52.100.

Lin, Mon S. Bubble blowing toy. 5,183,428, Cl. 446-15.000.

Lincoln Electric Company, The: *See*—
Enyedy, Edward A., 5,183,990, Cl. 219-121.540.

Lindbloom, Leon J.: *See*—
Wright, Roger G.; Lindbloom, Leon J.; and Midlam, Lewis C., 5,183,354, Cl. 404-81.000.

Linder, Karen E.; Nunn, Adrian D.; and Ramalingam, Kondareddiar, to E. R. Squibb & Sons, Inc. Boronic acid adducts of metal dioxime complexes useful in labelling proteins and other amine-containing compounds. 5,183,653, Cl. 424-1.100.

Lindig, Markus: *See*—
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,183,932, Cl. 560-330.000.

Lindmayer, Martin: *See*—
Claar, Klaus; Deischl, Hans; Lindmayer, Martin; Moczygemba, Jurgen; Schrader, Jergen; Schumacher, Josef; Topfer, Claus; and Robitschko, Peter, 5,184,022, Cl. 307-10.200.

Lindner, Christian; and Eichenauer, Herbert, to Bayer Aktiengesellschaft. Graft polymers and their use as flameproofing agents. 5,183,850, Cl. 525-73.000.

Lindstrom, Michael J.: *See*—
Forguy, Christian; Goetz, Frederick J.; Graeber, Edward L.; and Lindstrom, Michael J., 5,183,915, Cl. 558-341.000.

Line, Henri, to Helis. Horizontal broach with a mobile standard. 5,183,374, Cl. 409-286.000.

Lingham, Russell B.: *See*—
Bills, Gerald F.; Hensens, Otto D.; Koupal, Lawrence; Lingham, Russell B.; Ondeyka, John G.; and Zink, Deborah L., 5,183,826, Cl. 514-411.000.

Link Laboratory Inc.: *See*—
Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, 5,184,346, Cl. 370-60.000.

Link, Laura J., to Motorola, Inc. Vehicle route planning system. 5,184,303, Cl. 364-449.000.

Linn, Richard A. Pad holder. 5,183,153, Cl. 206-232.000.

Linz, Raymond E.: *See*—
Cox, Jerry D.; Linz, Raymond E.; Thome, Jeanne M.; Perry, Winfield B.; Hadley, Franklin O., Jr.; and Knobel, Vladimir A., 5,182,881, Cl. 51-7.000.

Lipha, Lyonnaise Industrielle Pharmaceutique: *See*—
Festal, Didier; Nioche, Jean-Yves; Descours, Denis; Bellemin, Robert; and Decerprit, Jacques, 5,183,924, Cl. 560-56.000.

Lipovski, G. Jack, to Board of Regents, The University of Texas System. Dynamic associative memory with logic-in-refresh. 5,184,325, Cl. 365-189.070.

Liprie, Samuel F.: *See*—
Hayman, Michael H.; Morgan, Lee R.; and Liprie, Samuel F., 5,183,455, Cl. 600-7.000.

Lisco, Inc.: *See*—
Meeker, Paul K.; and Gibson, William R., 5,183,311, Cl. 297-151.000.

Littmann, Martin: *See*—
Jansen, Johannes R.; and Littmann, Martin, 5,183,939, Cl. 564-302.000.

Litton Systems, Inc.: *See*—
Goldner, Eric L., 5,184,195, Cl. 356-350.000.
Huddle, James R., 5,184,304, Cl. 364-453.000.

Liu, Kou-Chang; and Taylor, Paul D., to ISP Investments Inc. Vinyloxy hydroxyalkylcycloalkane and preparation therefor. 5,183,946, Cl. 568-670.000.

Liu, Ti Y.; Chen, Chi J.; and Chen, Shou H., to Industrial Technology Research Institute. Process for manufacturing rare earth-iron-boron permanent magnet alloy powders. 5,183,494, Cl. 75-349.000.

Lo, Young S.: *See*—
Welstead, William J., Jr.; and Lo, Young S., 5,183,903, Cl. 548-952.000.

Lodico, James I.; Coder, David R.; Adams, Lawrence J.; Guthrie, Rebecca A. F.; Andes, Raymond M., Jr.; and Alexander, Philip G., to Deere & Company. Trash handling apparatus for a self-cleaning rotary screen. 5,183,487, Cl. 55-289.000.

Logan, James D.; and Bastin, Jeffrey R., to Bastin-Logan Water Services, Inc. Gravel well assembly. 5,183,110, Cl. 166-278.000.

Login, Robert B.; Merianos, John J.; Biss, Russell B.; and Garelick, Paul, to ISP Investments Inc. Urea-hydrogen peroxide-polyvinylpyrrolidone. 5,183,901, Cl. 548-543.000.

Long, Glen C.: *See*—
Weldon, William F.; Woodson, Herbert H.; and Long, Glen C., 5,183,957, Cl. 89-8.000.

Longyear Company: *See*—
Paech, Ivor N., 5,183,366, Cl. 414-22.520.

Lopez, Luis R.; and Sterhan, Marcia, to Reaads Medical Products, Inc. Method and diagnostic test kit for detection of anti-dsDNA antibodies. 5,183,735, Cl. 435-6.000.

Lorbiecki, James R., to Milsco Manufacturing Company. Concealed mechanism for detachably mounting a vehicle seat. 5,183,314, Cl. 297-440.000.

Lord Corporation: *See*—
Siwek, C. Kenneth; Flower, Wallace C.; and Garn, Gene D., 5,183,137, Cl. 188-381.000.

Lord, Steve: *See*—
Wolber, Jack; Lord, Steve; and Froehling, Dieter, 5,183,252, Cl. 271-276.000.

L'Oreal: *See*—
Baudin, Gilles, 5,183,189, Cl. 222-397.000.

Losing, Karl-Heinrich: *See*—
Hartel, Gunter; Schurfeld, Armin; Losing, Karl-Heinrich; Thonnesen, Dieter; and Remde, Ulrich, 5,182,942, Cl. 73-61.460.

Lotz, Hans-Georg, to Leybold Aktiengesellschaft. Heating apparatus for cooking food, especially a hot plate. 5,183,997, Cl. 219-464.000.

Louisiana-Pacific Corporation: *See*—
Chase, Peter D., 5,182,892, Cl. 52-539.000.

Love, Marc C., to Atlas Die, Inc. Reclosable dispenser carton. 5,183,202, Cl. 229-123.000.

Loving, Louis S.: *See*—
Adams, James W.; Loving, Louis S.; Betts, David A.; Donnelly, David P.; and Nunley, Alvin, III, 5,184,330, Cl. 367-111.000.

Lowry, Alan B.; Gelardi, Paul J.; and Rochelo, Donald R., to Shape Inc. Video tape cassette with a reusable recording enable/disable slide tab. 5,184,255, Cl. 360-60.000.

Lu, Shih-Lai, to Minnesota Mining and Manufacturing Company. Method of molding microstructure bearing composite plastic articles. 5,183,597, Cl. 264-1.400.

Luckenbach, Roy: *See*—
Taylor, Jeffrey L.; Luckenbach, Roy; Coco, Michael; and Twickler, Carl, 5,183,702, Cl. 428-266.000.

Lugo, Nicolas R. Shopping bag system and method. 5,182,895, Cl. 53-469.000.

Lummes, Stephen E.: *See*—
Stephens, William F. N.; and Lummes, Stephen E., 5,184,014, Cl. 250-237.00G.

Lundberg, George A., Jr., to E. J. Brooks Co. Locking or security seal. 5,183,301, Cl. 292-318.000.

Lunzman, Stephen V.: *See*—
Devier, Lonnie J.; Krone, John J.; Lunzman, Stephen V.; and Marsden, Howard A., 5,182,908, Cl. 60-420.000.

Luperti, Harry E.: *See*—
Edwards, Robert J.; and Luperti, Harry E., 5,183,246, Cl. 270-45.000.

Lurssen, Klaus: *See*—
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,183,932, Cl. 560-330.000.

Lusher, David M.: *See*—
Washburn, Robert D.; Wedeen, Robert S.; McClanahan, Robert F.; Council, William J.; and Lusher, David M., 5,184,288, Cl. 363-4.000.

Luxtron Corporation: *See*—
Wickersheim, Kenneth A.; and Adams, Bruce E., 5,183,338, Cl. 374-131.000.

Lyon, Robert K. Fluid reservoir containing arrow. 5,183,259, Cl. 273-418.000.

Lyons, Ray: *See*—
Clever, Eric; and Lyons, Ray, 5,183,409, Cl. 439-291.000.

M. Kamenstein, Inc.: *See*—
Acona, Bruce; and Ancona, Jane, 5,183,165, Cl. 211-77.000.

MacArthur, Duncan W.; Wolf, Michael A.; McAtee, James L.; Unruh, Wesley P.; Cucchiara, Alfred L.; and Huchton, Roger L., to United States of America, Energy. Long range alpha particle detector. 5,184,019, Cl. 250-380.000.

Maccherone, Larry, to Sweetheart Cup Company Inc. Apparatus and method for heat-sealing a film cover to open ended containers. 5,182,896, Cl. 53-478.000.

MacDonald, James C.: *See*—
Taylor, Raymond L.; Burns, Lee E.; and MacDonald, James C., 5,183,689, Cl. 427-164.000.

MacLane, Donald B.; Deur, Ted E.; Anderson, Jeffrey J.; Titterington, Donald R.; Oswald, James C.; and Meissner, Richard S., to Tektronix, Inc. Ink jet print head maintenance system. 5,184,147, Cl. 346-1.100.

MacMillan, Donald M., to Concorde Tool Corp. Adjustable length handle comprising automatically adjustable length mechanical power transmission. 5,182,965, Cl. 74-543.000.

Madou, Marc J.: *See*—
Joseph, Jose P.; and Madou, Marc J., 5,183,549, Cl. 204-415.000.

Maeda, Kazuo; and Kinoshita, Koichi, to Akebono Brake Industry Co., Ltd. Pin boot for a disc brake. 5,183,136, Cl. 188-73.440.

Maeda, Kenji. Kneading method of concrete. 5,183,332, Cl. 366-2.000.

Maejima, Kazuhiro: *See*—
Sugiyama, Hiroyuki; Miyamoto, Toshio; and Maejima, Kazuhiro, 5,182,994, Cl. 101-415.100.

Maeno, Masami: *See*—
Kuroyama, Yutaka; Maeno, Masami; and Sakakibara, Ikuo, 5,183,362, Cl. 407-118.000.

Maes, Roland F. Stabilization of peroxidase solutions by para-aminosalicyclic acid. 5,183,751, Cl. 435-188.000.

Magara, Takuji; and Yamamoto, Masahiro, to Mitsubishi Denki K.K. Wire-type electric discharge machining system capable magnetically of collecting material that has been removed from a workpiece and confirming the magnetic attraction. 5,183,986, Cl. 219-69.120.

Maguire, Roy L.: *See*—
Taft, Morris E.; Anderton, Peter W.; and Maguire, Roy L., 5,183,318, Cl. 305-39.000.

Maienfisch, Peter: *See*—
Ramos, Gerado; Ghisalba, Oreste; Schar, Hans-Peter; Frei, Bruno; Maienfisch, Peter; and O'Sullivan, Anthony C., 5,183,749, Cl. 435-119.000.

Mair, Billie J. Apparatus and method for grasping and stably lifting lids having a handle. 5,183,304, Cl. 294-10.000.

Mairlot, Henri: *See*—
D'Iribarne, Benoit; Mairlot, Henri; and Houang, Paul, 5,183,491, Cl. 65-351.000.

Makiguchi, Nobuyoshi: *See*—
Miyahara, Shoichiro; Shindo, Atsunori; Suzuki, Maki; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,183,754, Cl. 435-226.000.

Makiura, Yoshinori: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.

Maldera, Domenico: *See*—
Ricco, Mario; De Matthaeis, Sisto L.; and Maldera, Domenico, 5,183,209, Cl. 239-585.100.

Malecha, Gregory J., to Borg-Warner Automotive Transmission & Engine Components Corporations. Overrunning clutch having a cage design for directing lube flow. 5,183,139, Cl. 192-45.000.

Malinowski, Hans: *See*—
Guse, Rudolf; Nobis, Dieter; and Malinowski, Hans, 5,182,847, Cl. 29-527.700.

Malito, John T.; and Layman, Curtis M., to Nalco Chemical Company. Chemical aids for wet-grinding phosphate rock. 5,183,211, Cl. 241-16.000.

Mallary, Micheal L., to Digital Equipment Corporation. Transducer with improved inductive coupling. 5,184,267, Cl. 360-126.000.

Mallen, Russell: *See*—
Mukerji, Prosanto K.; Mallen, Russell; Demet, George; and Fuerhaupter, Harry, 5,183,692, Cl. 427-304.000.

Mallouk, Robert S.: *See*—
Branca, Phillip A.; Hubis, Daniel E.; Mallouk, Robert S.; and Perry, Randal L., 5,183,545, Cl. 204-252.000.

Mallow, William A.; and Dziuk, Jerome J., Jr., to Southwest Research Institute. Composition and method for detecting vapor and liquid reactants. 5,183,763, Cl. 436-106.000.

Mammarella, Nicolino: *See*—
Ruffini, Alberto; and Mammarella, Nicolino, 5,183,521, Cl. 156-142.000.

Mandel, Jonathan: *See*—
Monte, Charles; Worthington, Norman A., III; Mandel, Jonathan; and Davenport, Gary F., 5,183,398, Cl. 434-227.000.

Mangelsdorf, Christopher W., to Analog Devices, Incorporated. Multistage A/D converter. 5,184,130, Cl. 341-156.000.

Mann, Ralph V. System and method for teaching physical skills. 5,184,295, Cl. 364-410.000.

Mannesmann AG: *See*—
Becker, Eberhard; Schulte, Franz; Sprung, Hartwig; Staggl, Ronald; and Stoeber, Manfred, 5,183,377, Cl. 414-751.000.

Mannesmann Rexroth GmbH: *See*—
Stellwagen, Armin, 5,182,909, Cl. 60-426.000.

Manning, William R.: *See*—
Brog, Terrence K.; and Manning, William R., 5,183,610, Cl. 264-56.000.

Mano, Seiji: *See*—
Hariu, Kenichi; Chiba, Isamu; and Mano, Seiji, 5,184,140, Cl. 342-372.000.

Manteuffel, Hans J. M.: *See*—
Zimmermann, Heinz; and Manteuffel, Hans J. M., 5,183,565, Cl. 210-269.000.

Manz, Kenneth W.; and Powers, Christopher M., to SPX Corporation. Refrigerant recovery system. 5,182,918, Cl. 62-149.000.

Marchioro, Gaetano: *See*—
Rizzi, Amleto; and Marchioro, Gaetano, 5,183,922, Cl. 560-7.000.

Marco, Alex A., to Hughes Aircraft Company. Process of manufacturing lightweight, low cost microwave components. 5,182,849, Cl. 29-600.000.

Margerum, J. David: *See*—
Lim, Khoon C.; Margerum, J. David; Lackner, Anna M.; and Miller, Leroy J., 5,184,233, Cl. 359-46.000.

Margitich, Donald E.: *See*—
Wishneski, Todd W.; and Margitich, Donald E., 5,183,583, Cl. 252-182.240.

Marko, Ollie W.: *See*—
Yeh, Li-Tain; Kenney, Malcolm E.; Bokerman, Gary N.; Cannady, John P.; and Marko, Ollie W., 5,183,914, Cl. 556-467.000.

Marko, Paul D., to Motorola, Inc. Low profile antenna. 5,184,143, Cl. 343-749.000.

Marks, Kipley R. Nozzle mountings. 5,182,820, Cl. 4-541.400.

Markwell, John P.; Versaw, Wayne K.; Osterman, John C.; and Kelley, Philip M., to University of Nebraska, Board of Regents of the. Heat-labile phosphatase. 5,183,752, Cl. 435-196.000.

Marler, David O.: *See*—
Degnan, Thomas F., Jr.; Keville, Kathleen M.; Landis, Michael E.; Marler, David O.; and Mazzone, Dominick N., 5,183,557, Cl. 208-111.000.

Marquis, Edward T.; Speranza, George P.; and Su, Wei-Yang, to Texaco Chemical Company. Process for dissolving or removing rigid polyurethane foam by contacting with 1,2-dimethyl imidazole. 5,183,514, Cl. 134-38.000.

Marrone, Santino: *See*—
Twigg, Ray G.; Klug, Mark W.; Marrone, Santino; and Hawkes, Malcolm V., 5,184,068, Cl. 324-158.00F.

Marsden, Howard A.: *See*—
Devier, Lonnie J.; Krone, John J.; Lunzman, Stephen V.; and Marsden, Howard A., 5,182,908, Cl. 60-420.000.

Marshall, Robert: *See*—
Holmes, William S.; and Marshall, Robert, 5,183,649, Cl. 423-300.000.

Martensson, Lars; and Andersson, Jan, to Tetra Alfa Holdings SA. Apparatus for treating package container blanks. 5,183,644, Cl. 422-304.000.

Martin, Dale D.: *See*—
Reiterman, Lee; Martin, Dale D.; and Krysik, Joseph, 5,183,363, Cl. 408-59.000.

Martin, Dallas: *See*—
Hurtado, Larry; Curto, Rick A.; and Martin, Dallas, 5,183,956, Cl. 474-20.000.

Martin, Jack R., to General Electric Company. Turbine nozzle manufacturing method. 5,182,855, Cl. 29-889.220.
Martin, James H.; and Garro, Samuel J. Piston operated fluid dispensing device. 5,183,187, Cl. 222-287.000.
Martin, James P.: *See*—
Hubble, Fred F., III; Mitchell, John M., Jr.; and Martin, James P., 5,184,011, Cl. 250-231.140.
Martin, Jonathan G.: *See*—
Brooks, Dee W.; Stewart, Andrew O.; and Martin, Jonathan G., 5,183,818, Cl. 514-231.500.
Martin Marietta Energy Systems, Inc.: *See*—
Allman, Steve L.; Chen, Chung-Hsuan; and Chen, Fang C., 5,184,015, Cl. 250-282.000.
Lauf, Robert J.; Holcombe, Cressie E.; and Dykes, Norman L., 5,184,286, Cl. 361-529.000.
Martindell, J. Richard. Depth locator apparatus for insert bit holders. 5,182,973, Cl. 81-429.000.
Martinus De Bie, Joannes F.: *See*—
Scheeren, Johan W.; Martinus De Bie, Joannes F.; and De Vos, Dirk, 5,183,913, Cl. 556-446.000.
Maruden, Eiji: *See*—
Kitajima, Eiji; Oyama, Takashi; Maruden, Eiji; Teraoka, Hirokazu; Yamasaki, Haruki; and Shimizu, Susumu, 5,183,603, Cl. 264-29.200.
Maruo, Satoshi; Hattori, Chikamasa; and Kameyama, Fumio, to Brother Kogyo Kabushiki Kaisha. Control device for a tool driving unit. 5,184,053, Cl. 318-571.000.
Marutsuka, Toshinori: *See*—
Yosomiya, Ryutoku; Hirata, Mistutoshi; Morimoto, Kiyotaka; Takenishi, Soichiro; and Marutsuka, Toshinori, 5,183,611, Cl. 264-129.000.
Maruyama, Satoshi; Minorikawa, Naoki; Arakawa, Tsutomu; Yoshida, Haruo; Tagoshi, Hirotaka; and Abe, Kazuto, to Showa Denko K.K. 4,4'-bis(methacryloylthio)diphenylsulfide. 5,183,917, Cl. 558-251.000.
Marx, Ralph H. Finger support. 5,183,458, Cl. 602-22.000.
Masaki, Mitsuo; Takeda, Hiromitsu; Kamishiro, Toshiro; and Yamamoto, Masao, to Nippon Chemiphar Co., Ltd. Glycerol derivative and anti-hypertensive agent. 5,183,811, Cl. 514-79.000.
Maschinenfabrik J. Dieffenbacher GmbH & Co.: *See*—
Bielfeldt, Friedrich B., 5,182,986, Cl. 100-41.000.
Mashaw, Howard R., Jr.; and Hammett, Robert C., to Otis Engineering Corporation. Sleeve valve device and shifting tool therefor. 5,183,114, Cl. 166-319.000.
Maskasky, Joe E., to Eastman Kodak Company. Process for the preparation of high chloride tabular grain emulsions (V). 5,183,732, Cl. 430-569.000.
Mason, Robert F. Dental flossing tool. 5,183,065, Cl. 132-323.000.
Massarsky, Yefim, to Foto Fantasy, Inc. Camera position adjustment device. 5,184,160, Cl. 354-76.000.
Masuda, Noboru; Kamikawai, Ryotaro; Yagyu, Masayoshi; Yamamoto, Masakazu; Itoh, Hiroyuki; and Saito, Tatsuya, to Hitachi, Ltd. Clock signal supply system. 5,184,027, Cl. 307-269.000.
Masuda, Toshio. Foliar spray agent for protecting agricultural and horticultural plants against disease injury. 5,183,477, Cl. 47-58.000.
Masuda, Yoshitomo: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadsaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.
Masuhara, Eiichi; and Komiya, Shigeo, to Japan Institute of Advanced Dentistry. Process for adhesion of orthodontic bracket. 5,183,403, Cl. 433-9.000.
Masuhra, Shohei; Tonoki, Satoshi; Shibukawa, Toshiya; and Sugawara, Hirsohi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. Interior finish surface material for automobiles. 5,183,695, Cl. 428-151.000.
Matheson Gas Products, Inc.: *See*—
Pengler, Rudolf, 5,183,072, Cl. 137-113.000.
Mathewson, Christopher W., to Sayett Group, Inc. Stacked LCD color projector with equal path lengths. 5,184,234, Cl. 359-53.000.
Matsubara, Isao: *See*—
Takeishi, Hideo; Houseki, Sigeki; and Matsubara, Isao, 5,183,210, Cl. 239-703.000.
Matsuda, Koichi: *See*—
Yamaguchi, Soichiro; Matsuda, Koichi; and Goto, Hideo, 5,183,849, Cl. 525-68.000.
Matsuda, Takahiro: *See*—
Yumoto, Toshiyuki; Ohsono, Kouhei; Kanda, Masahiro; and Matsuda, Takahiro, 5,183,439, Cl. 474-28.000.
Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having on-chip test circuit and method for testing the same. 5,184,327, Cl. 365-201.000.
Matsui, Fumio: *See*—
Taniguchi, Hitoshi; and Matsui, Fumio, 5,183,726, Cl. 430-342.000.
Matsui, Kazuo: *See*—
Yasumura, Takaaki; Kiyomiya, Teruo; Mizuno, Yasutoshi; and Matsui, Kazuo, 5,183,517, Cl. 148-303.000.
Matsui, Masahiro; and Hashimoto, Yasuhiko, to Kawasaki Jukogyo Kabushiki Kaisha. Method of coupling magnetic position detecting device with brushless dc motor and the coupling structure thereof. 5,184,038, Cl. 310-42.000.
Matsumoto, Mitsuhiro: *See*—
Inaba, Shigemitsu; and Matsumoto, Mitsuhiro, 5,183,410, Cl. 439-489.000.
Matsumoto, Nobuo, to Tokai Rubber Industries, Ltd. Fluid-filled elastic mount having caulked portion for sealing off fluid chamber. 5,183,243, Cl. 267-140.130.
Matsumoto, Shinichi, to Canon Kabushiki Kaisha. Electronic translator with multiple speed searching function. 5,184,296, Cl. 364-419.000.
Matsumoto, Yasuo: *See*—
Murakami, Kazunori; Ikumi, Tomonori; Matsumoto, Yasuo; and Iwafune, Yasuo, 5,184,245, Cl. 359-196.000.
Matsumoto, Yukio: *See*—
Koyama, Toshiya; Matsumoto, Yukio; Yoshimoto, Hataaki; and Ito, Katsuhiro, 5,183,585, Cl. 252-299.010.
Matsumura, Toshiaki: *See*—
Mitani, Katsuaki; Matsumura, Toshiaki; and Yasumatsuya, Noboru, 5,184,224, Cl. 358-231.000.
Matsuo, Masahiro: *See*—
Ariyama, Tatsuro; Isozaki, Shinichi; Yamada, Kenzo; Matsuo, Masahiro; and Kanatani, Genji, 5,183,495, Cl. 75-379.000.
Matsuo, Shunji: *See*—
Haneda, Satoshi; Morita, Shizuo; Fukuchi, Masakazu; and Matsuo, Shunji, 5,184,187, Cl. 355-326.000.
Matsuoka, Fumio; Negoro, Kouichi; Sugimoto, Takeshi; Yamaguchi, Toshiaki; and Yamashita, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Refrigeration cycle system. 5,182,920, Cl. 62-206.000.
Matsuoka, Takeji, to MEC Machinery Co., Ltd. Method for making coiled springs. 5,182,930, Cl. 72-138.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Fukakusa, Masaharu; and Tomiyasu, Hiroshi, 5,184,263, Cl. 360-103.000.
Gejima, Seiji; Kawakita, Koji; Kimura, Suzushi; Okinaka, Hideyuki; and Hakotani, Yasuhiko, 5,183,786, Cl. 501-134.000.
Hamasaka, Hiroshi; Satoh, Isao; and Fukushima, Yoshihisa, 5,184,341, Cl. 369-54.000.
Kameyama, Shuichi; Shimomura, Hiroshi; and Kikuchi, Kazuya, 5,183,768, Cl. 437-26.000.
Kugimiya, Koichi; Sugaya, Yasuhiro; Inoue, Osamu; Satomi, Mitsuo; and Hirota, Ken, 5,183,631, Cl. 419-10.000.
Mitani, Katsuaki; Matsumura, Toshiaki; and Yasumatsuya, Noboru, 5,184,224, Cl. 358-231.000.
Shiratori, Tetsuya; Yamazaki, Fumio; and Taniguchi, Seiichi, 5,183,425, Cl. 445-29.000.
Ueda, Shuji; and Mochida, Shoro, 5,184,004, Cl. 235-462.000.
Yamaguchi, Seiji; Moro, Masaru; Kajikawa, Saburou; Kimura, Masahiro; Okubo, Hideo; Matsuyo, Tadashi; and Kawakami, Hiroshi, 5,182,833, Cl. 15-319.000.
Yanagisawa, Ryogo, 5,184,222, Cl. 358-183.000.
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Kitano, Motoi; Nakatani, Yoshio; Yoshida, Hideyuki; Hatta, Toshiya; and Nakatani, Seiichi, 5,183,594, Cl. 252-518.000.
Yukihiro, Makoto; and Katagiri, Mamoru, 5,183,621, Cl. 264-297.200.
Matsushita, Tsutomu: *See*—
Mihara, Teruyoshi; Matsushita, Tsutomu; Yao, Kenji; Hoshi, Masakatsu; Enokido, Yutaka; and Hirota, Yukitsugu, 5,184,204, Cl. 357-629.000.
Matsuura, Hiromi: *See*—
Fujii, Isao; Ajiki, Yoshio; Ishida, Yoichi; and Matsuura, Hiromi, 5,183,011, Cl. 123-1.00A.
Matsuura, Takaharu: *See*—
Ohtani, Mitsuaki; and Matsuura, Takaharu, 5,183,909, Cl. 549-463.000.
Matsuura, Yutaka: *See*—
Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 5,183,516, Cl. 148-302.000.
Matsuyo, Tadashi: *See*—
Yamaguchi, Seiji; Moro, Masaru; Kajikawa, Saburou; Kimura, Masahiro; Okubo, Hideo; Matsuyo, Tadashi; and Kawakami, Hiroshi, 5,182,833, Cl. 15-319.000.
Matsuzaki, Hitoshi: *See*—
Suda, Koichi; Matsuzaki, Hitoshi; Wada, Masayuki; and Ozeki, Shoichi, 5,184,272, Cl. 361-87.000.
Matsuzaki, Kenji: *See*—
Yamaguchi, Akira; Uno, Masaru; Sekikawa, Norio; Arai, Fumio; and Matsuzaki, Kenji, 5,183,484, Cl. 55-34.000.
Mattes, Kenneth C.; and Venepalli, Bhaskar R., to Sterling Winthrop Inc. Antiarrhythmic agents. 5,183,813, Cl. 514-150.000.
Mattiessen, Hans, to Dragerwerk Aktiengesellschaft. Measuring cell for electrochemically detecting a gas. 5,183,550, Cl. 204-415.000.
Matturro, Michael G.: *See*—
Jacobson, Allan J.; Lai, Wen-Yih F.; Matturro, Michael G.; Deckman, Harry W.; McHenry, James A.; Reynolds, Robert P.; and Zhang, Qiyao, 5,183,788, Cl. 502-4.000.
Matula, David W.: *See*—
Briggs, Willard S.; and Matula, David W., 5,184,318, Cl. 364-754.000.
Mauer, Andrew J.: *See*—
Mosehauer, Michael; Newell, Catherine D.; and Mauer, Andrew J., 5,184,194, Cl. 355-297.000.
Maurer, Dean J., to Honeywell, Inc. Piezoresistive pressure transducer with a conductive elastomeric seal. 5,184,107, Cl. 338-42.000.
Maurice, Daniel. Flat panel illumination system. 5,183,323, Cl. 362-32.000.
Mauro Bianchi S.A.: *See*—
Bianchi, Mauro, 5,183,285, Cl. 280-670.000.
Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Schneider, Frank, 5,184,292, Cl. 364-162.000.

May, John W.; and Mukherjee, Anujit, to Eastman Kodak Company. Field-enhanced charge injection amplification. 5,183,717, Cl. 430-97.000.

Mazda Motor Corporation: *See—*
Inada, Haruhiro; and Muramoto, Hisao, 5,183,288, Cl. 280-732.000.
Kageyama, Fumio; Kanazawa, Hirotaka; Takahara, Shin; and Morita, Toshiki, 5,183,127, Cl. 180-197.000.

Mazzone, Dominick N.: *See—*
Degnan, Thomas F., Jr.; Keville, Kathleen M.; Landis, Michael E.; Marler, David O.; and Mazzone, Dominick N., 5,183,557, Cl. 208-111.000.

McAtee, James L.: *See—*
MacArthur, Duncan W.; Wolf, Michael A.; McAtee, James L.; Unruh, Wesley P.; Cucchiara, Alfred L.; and Huchton, Roger L., 5,184,019, Cl. 250-380.000.

McCall, Thomas J., Jr.: *See—*
Gatten, Ronald A.; Miller, Leslie A.; McCall, Thomas J., Jr.; and Nau, Vance J., 5,183,486, Cl. 55-159.000.

McClain, Ray. High volume padding machine. 5,183,160, Cl. 209-234.000.

McClanahan, Robert F.: *See—*
Washburn, Robert D.; Wedeen, Robert S.; McClanahan, Robert F.; Council, William J.; and Lusher, David M., 5,184,288, Cl. 363-4.000.

McClung, Duane G.; and Mueller, Thomas C., to Herman Miller, Inc. Panel edge construction. 5,183,090, Cl. 144-350.000.

McCoan, Horace C.; and Collier, James V., to Colt's Manufacturing Company Inc. Semi-automatic firearm having a safety device preventing conversion to full automatic firing. 5,183,959, Cl. 89-148.000.

McCollom, Dale A.: *See—*
Cyr, Dwayne L.; and McCollom, Dale A., 5,182,822, Cl. 4-625.000.

McCray, Philip C.: *See—*
Kershaw, John K.; and McCray, Philip C., 5,183,118, Cl. 171-16.000.

McCurry, Patrick W.; Kellogg, James R.; Boekelheide, Karl; Sexton, Kenneth D.; Ellison, George A.; and Hocker, Robert A., to Elegant Design Solutions, Inc. Computer-controlled uninterruptible power supply. 5,184,025, Cl. 307-66.000.

McDade, Christine: *See—*
Venter, Jeremia J.; and McDade, Christine, 5,183,930, Cl. 560-217.000.

McEachern, Alexander; Nicholson, Jamie; and Waterman, Craig S., to Basic Measuring Instruments. Method and apparatus for disabling all operations of an electronic instrument except for an automatic test procedure. 5,184,066, Cl. 324-158.00R.

McGeown, Arthur J.: *See—*
Cooke, Michael J.; and McGeown, Arthur J., 5,183,402, Cl. 432-5.000.

McGovern, John T.: *See—*
Campoli, Ralph F.; and McGovern, John T., 5,183,961, Cl. 102-439.000.

McHenry, James A.: *See—*
Jacobson, Allan J.; Lai, Wen-Yih F.; Matturro, Michael G.; Deckman, Harry W.; McHenry, James A.; Reynolds, Robert P.; and Zhang, Qiyao, 5,183,788, Cl. 502-4.000.

McHugh, John M.: *See—*
Foulkes, Albert E., Jr.; and McHugh, John M., 5,183,358, Cl. 411-59.000.

McKean, Peter S., to Holset Engineering Company Limited. Variable geometry turbine inlet wall mounting assembly. 5,183,381, Cl. 415-150.000.

McKenna, Charles E. Preparation and use of thiophosphonates and thio-analogues of phosphonoformic acid. 5,183,812, Cl. 514-120.000.

McKinley, William E.: *See—*
Hollander, Milton B.; Jacobs, David R.; and McKinley, William E., 5,183,420, Cl. 439-457.000.

McLees, Donald J. Snap ring needle guard. 5,183,468, Cl. 604-164.000.

McLeod, Bruce R.: *See—*
Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., 5,183,456, Cl. 600-9.000.

McMahon, Michael R. Air filter cleaning apparatus. 5,182,832, Cl. 15-304.000.

McMahon, Rosemary F.: *See—*
Harper, Jon J.; Kuhlmann, George E.; Larson, Keith D.; McMahon, Rosemary F.; and Sanchez, Paul A., 5,183,933, Cl. 562-414.000.

McMillin, John V.; and Clark, Jay V., to National Computer Systems, Inc. Scannable form having a control mark column with encoded data marks. 5,184,003, Cl. 235-454.000.

McMullen, James G.: *See—*
Neugebauer, Constantine A.; Glascock, Homer H., II; Paik, Kyung W.; McMullen, James G.; and Neugebauer, Martha M., 5,184,206, Cl. 257-762.000.

McNab, Kevin M.: *See—*
Shahriary, Iradj; and McNab, Kevin M., 5,184,092, Cl. 331-16.000.

McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., to Reilly Industries, Inc. 4-(N-benzyl-N-methylamino)pyridine acid salts and use in preparation of polymer-supported catalysts. 5,183,895, Cl. 546-304.000.

MEC Machinery Co., Ltd.: *See—*
Matsuoka, Takeji, 5,182,930, Cl. 72-138.000.

Medford, Lester V.: *See—*
Kraus, Joseph S.; Lanzerotti, Louis J.; and Medford, Lester V., 5,184,311, Cl. 364-554.010.

Mediatronics, Inc.: *See—*
Daugherty, Ronald R.; and Petrocy, Richard J., 5,184,116, Cl. 340-764.000.

Medical Devices Corporation: *See—*
Bull, Brian S.; and Korpman, Ralph A., 5,184,188, Cl. 356-39.000.

Meeker, Paul K.; and Gibson, William R., to Lisco, Inc. Portable high chair/booster seat. 5,183,311, Cl. 297-151.000.

Megahertz Corporation: *See—*
Aldous, Stephen C.; and Dake, Guy M., 5,183,404, Cl. 439-55.000.

Meiattini, Franco, to Diesse Diagnostica Senese S.R.L. Copper containing reagent for the detection and determination of bilirubin in the urine. 5,183,762, Cl. 436-97.000.

Meichsner, Roland; and Schmickl, Werner, to Hewlett-Packard Company. Water based ink for ink-jet printing. 5,183,502, Cl. 106-22.00K.

Meier, Josef; and Niehaus, Gottfried, to Meier & Niehaus GmbH. Lining for receptacles. 5,183,176, Cl. 220-470.000.

Meier & Niehaus GmbH: *See—*
Meier, Josef; and Niehaus, Gottfried, 5,183,176, Cl. 220-470.000.

Meissner, Konrad E., to Atlas Pacific Engineering Company. Peach pitter blade assembly. 5,182,983, Cl. 99-486.000.

Meissner, Richard S.: *See—*
MacLane, Donald B.; Deur, Ted E.; Anderson, Jeffrey J.; Titterington, Donald R.; Oswald, James C.; and Meissner, Richard S., 5,184,147, Cl. 346-1.100.

Menahem, Israel; and Bacon, James, to Honeywell Inc. Three degree of freedom translational axis hand controller mechanism. 5,182,961, Cl. 74-471.0XY.

Mendelson, Yitzhak: *See—*
Harjunmaa, Hannu; Mendelson, Yitzhak; and Wang, Yi, 5,183,042, Cl. 128-633.000.

Menheere, Johannes C. J., to Wavin B.V. Inner tube element for use in a device for taking soil samples, and method for manufacturing such an inner tube element. 5,182,954, Cl. 73-864.450.

Mercedes-Benz AG: *See—*
Alt, Claus-Christian, 5,183,445, Cl. 475-230.000.
Bonne, Andreas; Claar, Klaus; and Schrader, Jurgen, 5,183,300, Cl. 292-216.000.
Bopp, Stefan, 5,183,017, Cl. 123-198.00D.
Claar, Klaus; Deischl, Hans; Lindmayer, Martin; Moczygemba, Jurgen; Schrader, Jergen; Schumacher, Josef; Topfer, Claus; and Robitschko, Peter, 5,184,022, Cl. 307-10.200.
Gellner, Harald, 5,182,964, Cl. 74-523.000.

Mercian Corporation: *See—*
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.

Merck & Co., Inc.: *See—*
Bills, Gerald F.; Hensens, Otto D.; Koupal, Lawrence; Lingham, Russell B.; Ondeyka, John G.; and Zink, Deborah L., 5,183,826, Cl. 514-411.000.
Greenlee, Mark L.; Salzmann, Thomas N.; and DiNinno, Frank P., 5,183,887, Cl. 540-364.000.
Greenlee, William J.; Patchett, Arthur A.; Hangauer, David; Walsh, Thomas F.; Fitch, Kenneth J.; Rivero, Ralph A.; and Dhanoa, Daljit S., 5,183,810, Cl. 514-63.000.
Saari, Walfred S.; Rodan, Gideon A.; Fisher, Thorsten E.; and Anderson, Paul S., 5,183,815, Cl. 514-172.000.

Merianos, John J.: *See—*
Login, Robert B.; Merianos, John J.; Biss, Russell B.; and Garelick, Paul, 5,183,901, Cl. 548-543.000.

Merkel, Stephen L., to Nordson Corporation. Method and apparatus for detecting bubbles in pressurized liquid dispensing systems. 5,182,938, Cl. 73-19.050.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Wanninger, Paul; Wild, Richard; Kleinschmidt, Ernst; and Spath, Helmut, 5,183,520, Cl. 149-19.910.

Messina, James. Deer repellent device and method. 5,183,661, Cl. 424-405.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Hanel, Peter; Helmrich, Harald; and Sander, Ulrich, 5,183,571, Cl. 210-649.000.

Methlie, Jennifer L.: *See—*
Wanger, Mark E.; Methlie, Jennifer L.; Stavely, Donald J.; and Oliver, Thomas C., 5,184,336, Cl. 369-34.000.

Metzler, Mark W.: *See—*
Crowe, Lawrence E.; and Metzler, Mark W., 5,184,291, Cl. 363-37.000.

Meyer, Heinrich: *See—*
Bressel, Burkhard; Meyer, Heinrich; Meyer, Walter; and Gedrat, Klaus, 5,183,552, Cl. 205-158.000.

Meyer, Walter: *See—*
Bressel, Burkhard; Meyer, Heinrich; Meyer, Walter; and Gedrat, Klaus, 5,183,552, Cl. 205-158.000.

Michlin, Steven B. Copier and printer toner hopper sealing device. 5,184,182, Cl. 355-260.000.

Microelectronics and Computer Technology Corporation: *See—*
Duane, Diana C.; Zilley, Eric L.; and Jordan, Robert C., 5,183,972, Cl. 174-251.000.

Middleton, Christopher O.; and Robson, Colin L., to Spectra Physics. Apparatus for automatic depth control for earth moving and grading. 5,184,293, Cl. 364-167.010.

Midlam, Lewis C.: *See—*
Wright, Roger G.; Lindbloom, Leon J.; and Midlam, Lewis C., 5,183,354, Cl. 404-81.000.

Mifune, Eiji: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.

MIGEN S.r.l.: *See*—
Gavagna, Libero, 5,183,218, Cl. 242-54.00R.

Mihara, Shinichi, to Olympus Optical Co., Ltd. Electronic imaging apparatus. 5,184,223, Cl. 358-209.000.

Mihara, Teruyoshi; Matsushita, Tsutomu; Yao, Kenji; Hoshi, Masakatsu; Enokido, Yutaka; and Hirota, Yukitsugu, to Nissan Motor Co., Ltd. Semiconductor device with high surge endurance. 5,184,204, Cl. 357-629.000.

Mikami, Toshihiro; Kohmura, Yukio; Ishida, Yoshinori; and Nogami, Akira, to Furukawa Electric Co., Ltd., The. Optical fiber soot synthesis apparatus. 5,183,490, Cl. 65-144.000.

Mile High Equipment Company: *See*—
Alvarez, Robert J.; Bredesen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., 5,182,925, Cl. 62-347.000.

Miles Inc.: *See*—
Corey, Paul F., 5,183,743, Cl. 435-18.000.
Zakaryan, Ara H.; Newallis, Peter E.; and Tice, Mark A., 5,183,916, Cl. 558-95.000.

Millay, George D.; and Powell, John D., to Wet 'N Wild, Inc. Method and apparatus for initiating a water ride. 5,183,437, Cl. 472-117.000.

Miller, Carl A.; Silverberg, Morton; and Supron, Steven A., to Pitney Bowes Inc. Mechanism and method for laterally aligning an accumulation of sheets. 5,183,250, Cl. 271-222.000.

Miller, Leroy J.: *See*—
Lim, Khoon C.; Margerum, J. David; Lackner, Anna M.; and Miller, Leroy J., 5,184,233, Cl. 359-46.000.

Miller, Leslie A.: *See*—
Gatten, Ronald A.; Miller, Leslie A.; McCall, Thomas J., Jr.; and Nau, Vance J., 5,183,486, Cl. 55-159.000.

Milliere, Paul: *See*—
Lafosse, Jean; and Milliere, Paul, 5,183,971, Cl. 174-138.00F.

Millipore Corporation: *See*—
Gilby, Anthony C.; and Carson, William W., 5,184,192, Cl. 356-246.000.

Milsco Manufacturing Company: *See*—
Lorbiecki, James R., 5,183,314, Cl. 297-440.000.

Milwaukee Valve Company, Inc: *See*—
Roberts, John L., 5,183,073, Cl. 137-385.000.

Mima, Hiroshi; Suzuki, Tadashi; and Kubota, Yasuhiko, to Murata Kikai Kabushiki Kaisha. Processing robot for a two-for-one-one twister. 5,182,902, Cl. 57-279.000.

Minami, Hirofumi: *See*—
Yuyama, Junpei; Geng, Qiquan; Chihara, Kazunori; Minami, Hirofumi; and Goto, Eiichi, 5,184,072, Cl. 324-248.000.

Minette, Daniel C., to Western Atlas International, Inc. Borehole formation model for testing nuclear logging instruments. 5,182,955, Cl. 73-865.600.

Minister of the Post, Telecommunications and Space (Centre National D'Etudes Des Telecommunications): *See*—
Devillers, Yves; Neveu, Frederic; Behe, Roger; and Ramat, Pierre, 5,184,145, Cl. 343-840.000.

Minnesota Mining and Manufacturing: *See*—
Bodziak, Douglas P.; Grovender, Steven L.; Hunder, Ray A.; Molenda, Robert P.; and Roth, Steven P., 5,183,297, Cl. 283-67.000.

Minnesota Mining and Manufacturing Company: *See*—
Birkholz, Ronald B.; and Glad, Mark D., 5,183,705, Cl. 428-343.000.
Duane, Diana C.; Zilley, Eric L.; and Jordan, Robert C., 5,183,972, Cl. 174-251.000.
Fundingsland, Jon W.; and Rogers, Ralph F., 5,183,415, Cl. 433-80.000.
Lu, Shih-Lai, 5,183,597, Cl. 264-1.400.
Weiss, John W., 5,184,274, Cl. 361-220.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ueda, Hideaki, 5,183,718, Cl. 430-59.000.

Minorikawa, Naoki: *See*—
Maruyama, Satoshi; Minorikawa, Naoki; Arakawa, Tsutomu; Yoshida, Haruo; Tagoshi, Hirotaka; and Abe, Kazuto, 5,183,917, Cl. 558-251.000.

Minowa, Masahiro, to Seiko Epson Corporation. Printer system for selective printing on first and second print media located in separate print zones. 5,183,333, Cl. 400-605.000.

Minster Machine Company, The: *See*—
Schockman, Robert L., 5,182,935, Cl. 72-417.000.

Minto, Robert E.: *See*—
Nicolaou, Kyriacos C.; Sorensen, Erik; Hwang, Chan-Kou; Discordia, Robert; Bergman, Robert G.; and Minto, Robert E., 5,183,942, Cl. 568-375.000.

MIPS Co., Ltd.: *See*—
Kaneda, Takashi; and Villwock, Thomas, 5,184,282, Cl. 361-395.000.

Mishima, Ryoji: *See*—
Ueno, Shuji; Hagiwara, Michiaki; Mishima, Ryoji; and Isoishi, Kiyoshi, 5,183,515, Cl. 148-101.000.

Mr. Coffee Inc.: *See*—
Hoffman, Ronald J.; Pillion, Lawrence M.; and Jewell, Paul L., 5,183,998, Cl. 219-492.000.

Mita Industrial Co., Ltd.: *See*—
Kida, Yasuhiko, 5,184,186, Cl. 355-321.000.
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.
Maekawa, Takashi, 5,183,239, Cl. 271-3.100.
Okada, Hiromi; and Otsuka, Masao, 5,183,248, Cl. 271-127.000.

Mita, Shiro: *See*—
Morita, Takakazu; Mita, Shiro; and Kawashima, Yoichi, 5,183,816, Cl. 514-224.200.

Mitani, Katsuaki; Matsumura, Toshiaki; and Yasumatsuya, Noboru, to Matsushita Electric Industrial Co., Ltd. Television projection screen having anti-static elements. 5,184,224, Cl. 358-231.000.

Mitani, Masao: *See*—
Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.

Mitchell, John M., Jr.: *See*—
Hubble, Fred F., III; Mitchell, John M., Jr.; and Martin, James P., 5,184,011, Cl. 250-231.140.

Mitchener, Rex L.: *See*—
Bailey, Kenneth M.; Mitchener, Rex L.; Wehking, Timothy J.; and Reith, Craig P., 5,182,940, Cl. 73-36.000.

Mitsche, Roy T.: *See*—
Wang, Li; and Mitsche, Roy T., 5,183,792, Cl. 502-242.000.

Mitsubishi Denki K.K.: *See*—
Fukui, Wataru; Iwata, Toshio; Ohashi, Yutaka; and Ikeuchi, Masayuki, 5,182,943, Cl. 73-116.000.
Ishida, Yasuhiko; and Kondo, Katsuhiko, 5,184,302, Cl. 364-431.110.
Magara, Takuji; and Yamamoto, Masahiro, 5,183,986, Cl. 219-69.120.
Takeuchi, Hiroshi; Sendai, Tomoko; and Sakai, Yozo, 5,183,988, Cl. 219-69.170.
Tanaka, Hirokazu; and Ito, Koichi, 5,184,109, Cl. 340-455.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Aiba, Yoshiko; Adachi, Hiroshi; and Adachi, Etsushi, 5,183,846, Cl. 524-865.000.
Hara, Toshiro; Sato, Yoshimasa; and Yagi, Noboru, 5,184,300, Cl. 364-431.100.
Hariu, Kenichi; Chiba, Isamu; and Mano, Seiji, 5,184,140, Cl. 342-372.000.
Ishizuka, Masahiro; and Hayashi, Kazuyuki, 5,183,440, Cl. 474-101.000.
Itoh, Kenji; Iida, Akio; and Urasaki, Shuji, 5,184,093, Cl. 331-25.000.
Iwatani, Shiro, 5,184,060, Cl. 322-99.000.
Kodai, Shojiro; Ochi, Katsunori; and Baba, Fumiaki, 5,184,209, Cl. 257-679.000.
Kondo, Katsumi, 5,184,104, Cl. 336-100.000.
Konishi, Yasuhiro; Kumanoya, Masaki; Dosaka, Katsumi; Komatsu, Takahiro; and Inoue, Yoshinori, 5,184,321, Cl. 365-51.000.
Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,184,327, Cl. 365-201.000.
Matsuoka, Fumio; Negoro, Kouichi; Sugimoto, Takeshi; Yamaguchi, Toshiaki; and Yamashita, Tetsuya, 5,182,920, Cl. 62-206.000.
Mitsui, Kastuyoshi; and Inuishi, masahide, 5,183,771, Cl. 437-44.000.
Miyata, Kazuaki, 5,183,773, Cl. 437-52.000.
Morita, Shingo; and Koiwa, Mitsuru, 5,183,024, Cl. 123-598.000.
Okuma, Shigeru; Furuhashi, Takeshi; Ikejima, Hiroyuki; and Ishii, Toshiaki, 5,183,980, Cl. 187-112.000.
Satoh, Shinichi, 5,183,774, Cl. 437-52.000.
Shimoda, Kyouzi; and Yoshimoto, Kyosuke, 5,184,338, Cl. 369-44.250.
Tsutsumi, Michinari; Endo, Atsushi; and Yada, Toshio, 5,183,533, Cl. 156-656.000.
Uenishi, Akio, 5,184,171, Cl. 354-416.000.
Uesaka, Kazuo; Okita, Kazumasa; and Arai, Tsutomu, 5,183,656, Cl. 424-76.100.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Honma, Akihiro; and Kurokawa, Masahiro, 5,183,539, Cl. 203-38.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Fujisawa, Mutsumi, 5,183,132, Cl. 180-247.000.
Ito, Masayoshi; Yamada, Kiichi; Otake, Katsunori; Miyata, Yasunobu; Narita, Tomohiro; and Nishikawa, Susumu, 5,183,128, Cl. 180-197.000.

Mitsubishi Kasei Corporation: *See*—
Takagishi, Iwao, 5,183,886, Cl. 540-141.000.
Ueno, Shuji; Hagiwara, Michiaki; Mishima, Ryoji; and Isoishi, Kiyoshi, 5,183,515, Cl. 148-101.000.

Mitsubishi Materials Corporation: *See*—
Tanaka, Yoshiyuki; and Itoh, Takaaki, 5,184,273, Cl. 361-120.000.

Mitsubishi Petrochemical Company Limited: *See*—
Kitagawa, Sadao; and Baba, Mitushige, 5,183,856, Cl. 525-282.000.

Mitsubishi Rayon Co., Ltd: *See*—
Fukushima, Hiroshi; Motonaga, Akira; Suda, Eriko; Nakajima, Mikito; Takeshita, Katsuyoshi; and Kutsukake, Yusuke, 5,183,870, Cl. 526-273.000.

Mitsubishi Steel Mfg. Co., Ltd.: *See*—
Abe, Tsuyoshi; Umezawa, Nobumasa; Fukuzumi, Tatsuo; Uchibori, Katsuyuki; Ozaki, Junji; and Motomura, Hiroharu, 5,183,634, Cl. 420-110.000.

Mitsui, Hidero; Kamaya, Naoki; Itoh, Hiroaki; and Sasaki, Yuu, to Sony Corporation. Battery casing. 5,183,714, Cl. 429-123.000.

Mitsui, Katsuyoshi; and Inuishi, masahide, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing LDDFET having double sidewall spacers. 5,183,771, Cl. 437-44.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Sakai, Hideki; Ishiwatari, Kazuo; and Ikejiri, Fumitoshi, 5,183,843, Cl. 524-318.000.
Mitsui Pharmaceuticals, Inc.: *See*—
Wakatake, Koichi, 5,183,638, Cl. 422-64.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Harada, Isao; Hokonohara, Hisashi; and Yamaguchi, Toshiaki, 5,183,647, Cl. 423-239.000.
Miyahara, Shoichiro; Shindo, Atsunori; Suzuki, Maki; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,183,754, Cl. 435-226.000.
Ohyama, Tsukasa; Shimokawa, Yasushi; Ghoda, Isamu; Takuma, Keisuke; and Koshida, Hitoshi, 5,183,474, Cl. 8-471.000.
Takemura, Yasuo; Narimatsu, Osamu; and Komatsu, Kazuyoshi, 5,183,699, Cl. 428-214.000.
Utsunomiya, Atsushi; Nakamura, Mitsuo; Kuwatsuka, Toshiaki; and Tanaka, Yoshinori, 5,183,927, Cl. 560-115.000.
Mittendorf, Donald H.: *See*—
Boo, H. Khim; Mittendorf, Donald H.; and Sell, Walter A., 5,183,212, Cl. 241-17.000.
Miura, Toshihiko: *See*—
Umetsu, Sachio; and Miura, Toshihiko, 5,182,843, Cl. 29-445.000.
Miwa, Takao; Ikeda, Takayoshi; Numata, Shunichi; Fujisaki, Koji; and Shimanoki, Hisae, to Hitachi, Ltd.; and Hitachi Chemical Company, Ltd. Acid anhydride complex and process for producing same, and composition containing same. 5,183,838, Cl. 524-109.000.
Miyahara, Kazuhiro, to NGK Insulators, Ltd. Method of manufacturing ceramic honeycomb-structural body. 5,183,609, Cl. 264-44.000.
Miyahara, Shoichiro; Shindo, Atsunori; Suzuki, Maki; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, to Mitsui Toatsu Chemicals, Incorporated. Method for production of human tissue type plasminogen activator. 5,183,754, Cl. 435-226.000.
Miyakawa, Naoomi: *See*—
Sato, Takeshi; Tashiro, Minoru; and Miyakawa, Naoomi, 5,183,993, Cl. 219-121.820.
Miyaki, Takeo: *See*—
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,183,808, Cl. 514-33.000.
Miyamoto, Masanori: *See*—
Ito, Hideaki; and Miyamoto, Masanori, 5,183,013, Cl. 123-48.00R.
Miyamoto, Toshio: *See*—
Sugiyama, Hiroyuki; Miyamoto, Toshio; and Maejima, Kazuhiro, 5,182,994, Cl. 101-415.100.
Miyamoto, Yauso: *See*—
Ichimura, Nobuo; Miyamoto, Yauso; and Yamazaki, Mitsuo, 5,183,592, Cl. 252-512.000.
Miyamoto, Yoshiaki; Sasaki, Teruo; Fujisawa, Kazuhiro; and Kato, Seinosuke, to Sumitomo Gomu Kogyo Kabushiki Kaisha. Earthquake-proofing device of peripherally restrained type. 5,182,888, Cl. 52-167.0DF.
Miyaoku, Yoshiyuki: *See*—
Taga, Kazumitsu; Narukami, Toshihiko; and Miyaoku, Yoshiyuki, 5,183,678, Cl. 426-448.000.
Miyasaka, Hitoshi: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.
Miyasaka, Takashi: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.
Miyashita, Mitsuo. Stapler assistor. 5,183,196, Cl. 227-63.000.
Miyashita, Takanori: *See*—
Sakata, Shinji; Miyashita, Takanori; Kondo, Kazuhiko; Sakai, Atsushi; Shibata, Toshiyuki; and Ogawa, Takayuki, 5,183,882, Cl. 514-49.000.
Miyashita, Takashi; Miyazawa, Yoshinaga; and Kikuchi, Zenta, to Casio Computer Co., Ltd. Twisted nematic liquid crystal display device with retardation plates having phase axis direction within 15° of alignment direction. 5,184,236, Cl. 359-63.000.
Miyata, Kazuaki, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing semiconductor device including such input protection transistor. 5,183,773, Cl. 437-52.000.
Miyata, Yasunobu: *See*—
Ito, Masayoshi; Yamada, Kiichi; Otake, Katsunori; Miyata, Yasunobu; Narita, Tomohiro; and Nishikawa, Susumu, 5,183,128, Cl. 180-197.000.
Miyatake, Isao: *See*—
Fukuoka, Kazuhiro; Kiyohara, Keiki; Konishi, Tadayuki; Miyatake, Isao; and Hamamoto, Masaji, 5,183,500, Cl. 106-1.220.
Miyauchi, Yuji; Yoshii, Shinichi; and Kanamori, Tatsuru, to Olympus Optical Co., Ltd. Finder optical system. 5,184,252, Cl. 359-715.000.
Miyazaki, Akihiko, to U.S. Philips Corporation. Method of and apparatus for automatically controlling exposure. 5,184,172, Cl. 354-432.000.
Miyazaki, Hiroya: *See*—
Ouchi, Hideo; and Miyazaki, Hiroya, 5,183,341, Cl. 384-446.000.
Miyazaki, Tadaaki: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.
Miyazaki, Takeo: *See*—
Kawai, Michiki; and Miyazaki, Takeo, 5,183,221, Cl. 242-310.000.
Miyazaki, Takeshi: *See*—
Omoto, Kouichi; and Miyazaki, Takeshi, 5,183,742, Cl. 435-14.000.
Miyazawa, Kazuyuki: *See*—
Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.
Miyazawa, Tetsuhiro: *See*—
Goto, Shigeki; Shimei, Masato; Miyazawa, Tetsuhiro; Saitou, Yoshitami; and Isono, Nobuyuki, 5,182,970, Cl. 74-866.000.
Miyazawa, Yasunaga: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.
Miyazawa, Yoshinaga: *See*—
Miyashita, Takashi; Miyazawa, Yoshinaga; and Kikuchi, Zenta, 5,184,236, Cl. 359-63.000.
Mizuno, Masato; and Oishi, Kengo, to Fuji Photo Film Co., Ltd. Magnetic tape cassette. 5,184,268, Cl. 360-132.000.
Mizuno, Yasutoshi: *See*—
Yasumura, Takaaki; Kiyomiya, Teruo; Mizuno, Yasutoshi; and Matsui, Kazuo, 5,183,517, Cl. 148-303.000.
Mizuta, Akira: *See*—
Nakata, Tomohiro; and Mizuta, Akira, 5,184,197, Cl. 356-426.000.
Mizutani, Hideo: *See*—
Nakagawa, Masahiro; Mizutani, Hideo; Komatsu, Kouichirou; and Nojima, Yawara, 5,184,196, Cl. 356-401.000.
Mobil Oil Corporation: *See*—
Boyd, Dana M., 5,183,158, Cl. 206-554.000.
Cardis, Angeline B.; and Shanholtz, Carl E., 5,183,475, Cl. 44-343.000.
Chitnis, Girish K.; Herbst, Joseph A.; and Valyocsik, Ernest W., 5,183,790, Cl. 502-67.000.
Degnan, Thomas F., Jr.; Keville, Kathleen M.; Landis, Michael E.; Marler, David O.; and Mazzone, Dominick N., 5,183,557, Cl. 208-111.000.
Kirker, Garry W.; Degnan, Thomas F., Jr.; Huss, Albin, Jr.; and Landis, Michael E., 5,183,559, Cl. 208-119.000.
Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., 5,183,561, Cl. 208-251.00R.
Owen, Hartley; and Schipper, Paul H., 5,183,558, Cl. 208-113.000.
Paul, James M.; and Morris, Richard L., 5,183,112, Cl. 166-312.000.
Raterman, Michael F.; and Thiel, Michael D., 5,183,480, Cl. 55-12.000.
Mochida, Shoro: *See*—
Ueda, Shuji; and Mochida, Shoro, 5,184,004, Cl. 235-462.000.
Moczygemba, Jurgen: *See*—
Claar, Klaus; Deischl, Hans; Lindmayer, Martin; Moczygemba, Jurgen; Schrader, Jergen; Schumacher, Josef; Topfer, Claus; and Robitschko, Peter, 5,184,022, Cl. 307-10.200.
Moeneclaey, Denis, to Picanol N.V., naamloze vennootschap. Rapier guide with two series of guide elements. 5,183,084, Cl. 139-449.000.
Mohn, Jurgen; and Heine, Wilhelm, to DT Membranfilter Vertriebs GmbH. Apparatus for filtering and separating flowing medium. 5,183,567, Cl. 210-321.750.
Mohring, Volker; and Zellmer, Volker, to Th. Goldschmidt AG. Method for the preparation of highly elastic forms of reduced compression hardness having polyurethane groups. 5,183,830, Cl. 521-107.000.
Molenda, Robert P.: *See*—
Bodziak, Douglas P.; Grovender, Steven L.; Hunder, Ray A.; Molenda, Robert P.; and Roth, Steven P., 5,183,297, Cl. 283-67.000.
Molpus, J. Lane; Levinthal, Adam; and Werner, Ross, to Next Computer, Inc. Method and apparatus for compressing and storing pixels. 5,184,124, Cl. 341-50.000.
Momiyama, Yoshiharu: *See*—
Kikuchi, Hiroshi; Nakajima, Shigeki; Ono, Hisao; and Momiyama, Yoshiharu, 5,184,177, Cl. 355-200.000.
Monahan, Russell E.: *See*—
Adler, Jonathan M.; Monahan, Russell E.; and Frayer, Robert W., Jr., 5,184,069, Cl. 324-207.220.
Monarch Knitting Machinery Corporation: *See*—
Pernick, David, 5,182,927, Cl. 66-54.000.
Monitel Products Corp.: *See*—
Tarr, Leonard; King, Gregory; and Johansen, Brian, 5,184,179, Cl. 355-206.000.
Monsanto Company: *See*—
Coleman, James P., 5,183,584, Cl. 252-186.380.
Crutchfield, Marvin M.; and Reuben, Bertie J., 5,183,473, Cl. 8-110.000.
Gomez, Peter M., 5,183,852, Cl. 525-101.000.
Jakse, Frank P.; Morris, Donald E.; and Vanderlinde, William, 5,183,918, Cl. 558-271.000.
Montana Power Company, The: *See*—
Clark, Steven J., 5,183,102, Cl. 165-48.100.
Montanari, Jean-Louis, to Societe Francaise de Detecteurs Infrarouges (SOFRADIR). Reversible production process for assembly of circuit board and substrate. 5,182,852, Cl. 29-840.000.
Montasham, Mani; and Gharagozloo, Hamid. Sun shield assembly. 5,183,094, Cl. 160-370.200.

Monte, Charles; Worthington, Norman A., III; Mandel, Jonathan; and Davenport, Gary F., to Software Toolworks, The. Apparatus and method for interactive instruction of a student. 5,183,398, Cl. 434-227.000.
Montres Breguet S.A.: *See—*
Caspar, Michel, 5,184,333, Cl. 368-28.000.
Moore Business Forms, Inc.: *See—*
Parker, Rebecca L., 5,183,527, Cl. 156-555.000.
Walter, George E., 5,183,526, Cl. 156-556.000.
Moore Products Co.: *See—*
Kohler, Raymond H., 5,184,094, Cl. 331-158.000.
Morales, Francisco J. Revolver hand grip. 5,183,952, Cl. 42-71.020.
Morely, Richard A.: *See—*
Jorstad, John L.; Morely, Richard A.; and Overbagh, William H., 5,183,025, Cl. 123-669.000.
Morgan, Denny E., to Caterpillar Inc. Linear position sensor with equalizing means. 5,182,979, Cl. 92-5.00R.
Morgan, Lee R.: *See—*
Hayman, Michael H.; Morgan, Lee R.; and Liprie, Samuel F., 5,183,455, Cl. 600-7.000.
Mori, Hideki: *See—*
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Mori, Koji: *See—*
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Mori, Shosei: *See—*
Terada, Masahiro; Togano, Takeshi; Yamashita, Masataka; Iwaki, Takashi; Mori, Shosei; and Shinjo, Kenji, 5,183,586, Cl. 252-299.610.
Moriarty, Ann M., to Scripps Research Institute, The. Antibodies, diagnostic systems and methods for assaying SV40 HBxAg. 5,183,734, Cl. 435-5.000.
Morimoto, Kiyotaka: *See—*
Yosomiya, Ryutoku; Hirata, Mistutoshi; Morimoto, Kiyotaka; Takenishi, Soichiro; and Marutsuka, Toshinori, 5,183,611, Cl. 264-129.000.
Morita, Hideo: *See—*
Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, 5,183,857, Cl. 525-285.000.
Morita, Shingo; and Koiwa, Mitsuru, to Mitsubishi Denki Kabushiki Kaisha. Ignition device for internal combustion engine. 5,183,024, Cl. 123-598.000.
Morita, Shizuo: *See—*
Haneda, Satoshi; Morita, Shizuo; Fukuchi, Masakazu; and Matsuo, Shunji, 5,184,187, Cl. 355-326.000.
Morita, Shoji; Yamada, Yoshihiko; and Hara, Seinosuke, to Atsugi Unisia Corporation. Valve operating apparatus. 5,183,015, Cl. 123-90.160.
Morita, Takakazu; Mita, Shiro; and Kawashima, Yoichi, to Santen Pharmaceutical Co., Ltd. Bicyclic sulfur-containing compounds. 5,183,816, Cl. 514-224.200.
Morita, Tatsuo: *See—*
Nishino, Hiromi; Tarui, Keiji; Toyoshi, Hideyuki; and Morita, Tatsuo, 5,183,725, Cl. 430-313.000.
Morita, Toshiki: *See—*
Kageyama, Fumio; Kanazawa, Hirotaka; Takahara, Shin; and Morita, Toshiki, 5,183,127, Cl. 180-197.000.
Morita, Yasushi; Ohtori, Akira; and Andoh, Masako, to Senju Pharmaceutical Co., Ltd. Controlled drug release composition. 5,183,662, Cl. 424-426.000.
Moriwaki, Kaoru: *See—*
Nagai, Masahiko; Watai, Hiroo; Nagumo, Takaharu; and Moriwaki, Kaoru, 5,184,308, Cl. 364-489.000.
Moro, Masaru: *See—*
Yamaguchi, Seiji; Moro, Masaru; Kajikawa, Saburou; Kimura, Masahiro; Okubo, Hideo; Matsuyo, Tadashi; and Kawakami, Hiroshi, 5,182,833, Cl. 15-319.000.
Moronaga, Kenji: *See—*
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Morooka, Toru; and Okamoto, Yuji, to Sharp Kabushiki Kaisha. Automatic document feeder. 5,183,240, Cl. 271-3.100.
Morozumi, Kazuhiko: *See—*
Kadota, Michio; and Morozumi, Kazuhiko, 5,184,042, Cl. 310-313.00A.
Morris, Donald E.: *See—*
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Morris, Glenn H., Sr. Child drowning protecting guard for an open head nestable container. 5,183,179, Cl. 220-694.000.
Morris, Richard L.: *See—*
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Morrison, Barry: *See—*
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,182,851, Cl. 29-827.000.
Mortgat, Regis: *See—*
Canat, Jean-Noel; and Mortgat, Regis, 5,183,629, Cl. 376-439.000.
Mosehauer, Michael; Newell, Catherine D.; and Mauer, Andrew J., to Eastman Kodak Company. Carrier particle scavenging device. 5,184,194, Cl. 355-297.000.
Motomura, Hiroharu: *See—*
Abe, Tsuyoshi; Umezawa, Nobumasa; Fukuzumi, Tatsuo; Uchibori, Katsuyuki; Ozaki, Junji; and Motomura, Hiroharu, 5,183,634, Cl. 420-110.000.
Motonaga, Akira: *See—*
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Motorola, Inc.: *See—*
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Link, Laura J., 5,184,303, Cl. 364-449.000.
Marko, Paul D., 5,184,143, Cl. 343-749.000.
Mukerji, Prosanto K.; Mallen, Russell; Demet, George; and Fuerhaupter, Harry, 5,183,692, Cl. 427-304.000.
Patino, Joseph; Fernandez, Jose M.; and Bogut, Henry A., 5,184,059, Cl. 320-15.000.
Riordan, Kenneth B., 5,184,349, Cl. 370-95.300.
Rutter, Robert E.; and d'Aragona, Frank S., 5,183,769, Cl. 437-31.000.
Schultz, Charles P., 5,184,120, Cl. 340-870.380.
Sugai, Maureen, 5,183,181, Cl. 221-155.000.
Zobel, Don W., 5,184,028, Cl. 307-270.000.
Mott, Philip J., to Borg-Warner Automotive Transmission & Engine Components Corporation. Force ratio control of continuously variable transmissions. 5,182,968, Cl. 74-856.000.
Mott, Stephen D.; and Johnson, Richard F., to Protein Technologies International, Inc. Process for producing a functional protein product from vegetable protein materials. 5,183,683, Cl. 426-641.000.
Mouney, Daniel F. Nasal aspirator. 5,183,467, Cl. 604-149.000.
Mounier, Remy: *See—*
Salerno, Martine S.; Mounier, Remy; and Breda, Bernard, 5,183,588, Cl. 252-312.000.
Movern, John B. Restricted use hypodermic syringe. 5,183,466, Cl. 604-110.000.
Movid Information Technology, Inc.: *See—*
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Moyer, John A.: *See—*
Abou-Gharbia, Magid A. M.; and Moyer, John A., 5,183,819, Cl. 514-255.000.
Mrozowski, Joseph E.; Fusco, Jeffery K.; and Albaisa, Alfonso, to Nissan Design International, Inc. Spare tire lowering system. 5,183,192, Cl. 224-42.210.
Mta Szegedi Biologiai Kozpontja: *See—*
Simoncsits, Andras; Kalman, Miklos; Kari, Csaba; and Cserpan, Imre, 5,183,748, Cl. 455-91.000.
Mueller, Roman, to Buehler AG. Process and apparatus for separating grain mixture. 5,183,161, Cl. 209-467.000.
Mueller, Thomas C.: *See—*
McClung, Duane G.; and Mueller, Thomas C., 5,183,090, Cl. 144-350.000.
Mui, Paul K.: *See—*
Foote, Wayne E.; Mui, Paul K.; and Sleger, Roger R., 5,184,265, Cl. 360-106.000.
Mukerji, Prosanto K.; Mallen, Russell; Demet, George; and Fuerhaupter, Harry, to Motorola, Inc. Polyimide coating having electroless metal plate. 5,183,692, Cl. 427-304.000.
Mukherjee, Anujit: *See—*
May, John W.; and Mukherjee, Anujit, 5,183,717, Cl. 430-97.000.
Muller, Erwin, to Siemens Aktiengesellschaft. Housing for an electromechanical component, particularly for a relay. 5,184,102, Cl. 335-202.000.
Muller, Heiner. Device for training of differentiation. 5,183,399, Cl. 434-322.000.
Muller, Johannes C. A.; and Vollmann, Norbert C., to U.S. Philips Corporation. Helical-scan magnetic tape apparatus having a tape-transport path with twisting path-sections for tape-path correction. 5,184,259, Cl. 360-85.000.
Muller, Klaus-Helmut; Kluth, Joachim; Konig, Klaus; Gassen, Karl-Rudolf; Findeisen, Kurt; Lindig, Markus; Lurssen, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Herbicidal substituted 4-amino-5-alkylthio-1,2,4-triazol-3-ones. 5,183,932, Cl. 560-330.000.
Muller, Michael: *See—*
Asmussen, Erik; Munksgaard, Erik C.; Muller, Michael; Podszun, Wolfgang; and Winkel, Jens, 5,183,832, Cl. 522-84.000.
Muneishi, Shigetoshi: *See—*
Nakamatsu, Toshio; Terao, Masanobu; Muneishi, Shigetoshi; Kometani, Norio; and Hayashi, Yoshiaki, 5,183,892, Cl. 546-76.000.
Munksgaard, Erik C.: *See—*
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Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.
Murakami, Hiroshi; and Sakaida, Tetsu. Speed reducer. 5,183,443, Cl. 475-168.000.
Murakami, Kazunori; Ikumi, Tomonori; Matsumoto, Yasuo; and Iwafune, Yasuo, to Tokyo Electric Co., Ltd. Optical scanning system. 5,184,245, Cl. 359-196.000.
Muramoto, Hisao: *See—*
Inada, Haruhiro; and Muramoto, Hisao, 5,183,288, Cl. 280-732.000.
Murata, Kazushige; and Ito, Takeshi, to Inax Corporation. Pressurized slip casting apparatus. 5,183,668, Cl. 425-84.000.
Murata Kikai Kabushiki Kaisha: *See—*
Mima, Hiroshi; Suzuki, Tadashi; and Kubota, Yasuhiko, 5,182,902, Cl. 57-279.000.

Murata, Kimiyo: *See*—
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Murata Manufacturing Co., Ltd.: *See*—
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Wakino, Kikuo; Hishikawa, Toshio; Ishikawa, Youhei; Takehara, Koichi; and Tanizaki, Toru, 5,184,096, Cl. 333-175.000.
Yoshinaga, Takashi, 5,184,043, Cl. 310-320.000.
Murphy, James: *See*—
Servido, John L.; Tucker, Robert E.; and Murphy, James, 5,183,483, Cl. 55-26.000.
Murphy, James V.; and Murphy, Michael J., to Advanced Interconnections Corporation. Socket constructed with molded-in lead frame providing means for installing additional component such as a chip capacitor. 5,184,285, Cl. 361-421.000.
Murphy, Michael J.: *See*—
Murphy, James V.; and Murphy, Michael J., 5,184,285, Cl. 361-421.000.
Murray Equipment, Inc.: *See*—
Callahan, David D.; Reese, Craig; Baxter, Douglas P.; and Murray, Stephen M., 5,183,147, Cl. 198-524.000.
Murray, S. Frank: *See*—
Calabrese, Salvadore J.; Scarton, Henry A.; Murray, S. Frank; Ettles, Christopher M.; Kennedy, Warren C.; Dinc, Saim; Jlidi, Bessem; and Strong, William, 5,183,955, Cl. 84-437.000.
Murray, Stephen M.: *See*—
Callahan, David D.; Reese, Craig; Baxter, Douglas P.; and Murray, Stephen M., 5,183,147, Cl. 198-524.000.
Mutaguchi, Masao: *See*—
Uno, Nayomon; and Mutaguchi, Masao, 5,182,887, Cl. 52-167.00R.
Mutoh Industries Ltd.: *See*—
Suzuki, Masaaki; and Eshita, Tooru, 5,182,861, Cl. 33-18.100.
Mutoh, Nobuyoshi: *See*—
Sakai, Keijiro; Endo, Tunehiro; Kubota, Yuzuru; Ikimi, Takashi; Mutoh, Nobuyoshi; and Honbu, Mitsuyuki, 5,184,057, Cl. 318-803.000.
Myers, Gary L., to Fort Lock Corporation. Method of providing a universal keyway lock and plug therefor. 5,182,929, Cl. 70-337.000.
Myers, Harold D., to Dow Chemical Company, The. Integrated process for the production of dimethyl carbonate. 5,183,920, Cl. 558-277.000.
Myers, Terrence L., to Hughes Aircraft Company. Sample-and-hold droop compensator for high speed high resolution analog-to-digital converter. 5,184,127, Cl. 341-122.000.
Myllymaki, Olavi: *See*—
Lehtomaki, Ilkka; Karinen, Pertti; Bergelin, Risto; and Myllymaki, Olavi, 5,183,677, Cl. 426-436.000.
Nagafuji, Toshiaki, to NEC Corporation. Connector for coaxial cable. 5,183,412, Cl. 439-578.000.
Nagai, Masahiko; Watai, Hiroo; Nagumo, Takaharu; and Moriwaki, Kaoru, to Hitachi, Ltd. Fault simulation method. 5,184,308, Cl. 364-489.000.
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Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shinomoto, Shoji; and Nagai, Masahiko, 5,183,921, Cl. 558-301.000.
Naganuma, Akiko: *See*—
Tanaka, Kazuyoshi; Isobe, Toshifumi; Itaya, Masahiko; and Naganuma, Akiko, 5,184,146, Cl. 346-1.100.
Nagaoka, ;Masahide: *See*—
Kishi, Hiroyuki; Kimura, Hitoshi; Yamamoto, Katsuya; Tamura, Yoshinobu; Sakauchi, Tsuneo; Nagaoka, ;Masahide; and Tsuchiya, Yasuyu, 5,183,836, Cl. 523-404.000.
Nagato, Hitoshi: *See*—
Higuchi, Kazuhiko; Hirahara, Shuzo; Saito, Tutomu; Nagato, Hitoshi; and Iwamoto, Akito, 5,183,347, Cl. 400-583.300.
Nagumo, Takaharu: *See*—
Nagai, Masahiko; Watai, Hiroo; Nagumo, Takaharu; and Moriwaki, Kaoru, 5,184,308, Cl. 364-489.000.
Nagy, Michael E., to International Business Machines Corporation. Method of decompressing compressed data. 5,184,126, Cl. 341-67.000.
Naito, Genpei, to Nissan Motor Co., Ltd. System for controlling drive torque distributing clutch of vehicle. 5,183,131, Cl. 180-233.000.
Naito, Hideki; Yokoyama, Shigeki; and Tsukahara, Jiro, to Fuji Photo Film Co., Ltd. Method for forming color image. 5,183,729, Cl. 430-385.000.
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, to Takeda Chemical Industries, Ltd. Method for production of T-butyl 3-oxobutyrates and their use. 5,183,929, Cl. 560-178.000.
Najjar, Mitri S.; and Hilmar, Martin D., to Texaco Inc. Separation by membrane techniques. 5,183,482, Cl. 55-16.000.
Najmy, Stephen W.: *See*—
Holbrook, Michael T.; Hebert, Lawrence A.; Najmy, Stephen W.; Stine, Ernest F., Jr.; and Hasche, Reimer, 5,183,797, Cl. 502-355.000.
Naka, Takehiko; and Nishikawa, Kohei, to Takeda Chemical Industries, Ltd. Pyrazole derivative. 5,183,899, Cl. 548-253.000.
Nakabayashi, Isao: *See*—
Akahoshi, Sumihisa; Akimura, Hitoshi; Nakabayashi, Isao; Ishii, Masami; Ohi, Tamio; and Yoshida, Makoto, 5,183,591, Cl. 252-503.000.
Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, to Otsuka Kagaku Kabushiki Kaisha. All solid-state battery. 5,183,716, Cl. 429-192.000.
Nakagawa, Masahiro; Mizutani, Hideo; Komatsu, Kouichirou; and Nojima, Yawara, to Nikon Corporation. Projection exposure apparatus. 5,184,196, Cl. 356-401.000.
Nakagawa, Nobuhide: *See*—
Hattori, Ryuichi; and Nakagawa, Nobuhide, 5,182,982, Cl. 99-404.000.
Nakagawa, Tatsuya, to Kabushiki Kaisha Toshiba. Cooking apparatus with cooking information display means. 5,183,984, Cl. 219-10.55M.
Nakagawa, Yasuhito, to Sharp Kabushiki Kaisha. Interconnection method for semiconductor device comprising a high-temperature superconductive material. 5,183,800, Cl. 505-1.000.
Nakahara, Kazuyuki: *See*—
Hayashi, Keisuke; Ishigaki, Kouji; Nakahara, Kazuyuki; Yanagida, Masato; and Kishi, Fumio, 5,184,184, Cl. 355-296.000.
Nakajima, Mikito: *See*—
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Nakajima, Shigeki: *See*—
Kikuchi, Hiroshi; Nakajima, Shigeki; Ono, Hisao; and Momiyama, Yoshiharu, 5,184,177, Cl. 355-200.000.
Nakajima, Shin; Aoyama, Hiroyuki; Kagawa, Rihito; and Shimoe, Osamu, to Hitachi Metals, Ltd. High-voltage pulse generating circuit, and discharge-excited laser and accelerator containing such circuit. 5,184,085, Cl. 328-65.000.
Nakajima, Tadashi: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.
Nakajima, Yoshinobu: *See*—
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Nakamatsu, Toshio; Terao, Masanobu; Muneishi, Shigetoshi; Kometani, Norio; and Hayashi, Yoshiaki, to Sumitomo Chemical Company, Limited; and Daili Chemical Company, Limited. Anthrapyridone compounds. 5,183,892, Cl. 546-76.000.
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Takeuchi, Hiroyuki; Nozokido, Tatsuo; and Nakamura, Chikako, 5,184,073, Cl. 324-309.000.
Nakamura, Ichiro: *See*—
Akasaka, Yoshimichi; Nakamura, Ichiro; and Gotoh, Yasuharu, 5,182,978, Cl. 91-499.000.
Nakamura, Masanori; Hirakouchi, Hiroshi; Yatsuka, Takeshi; Kadowaki, Nobuo; and Endoh, Hiroshi, to Toyo Boseki Kabushiki Kaisha; and Nippon Steel Corporation. Viscoelastic resin composition for vibration-damping material. 5,183,863, Cl. 525-438.000.
Nakamura, Michio; Okunosono, Toshihiko; and Kajikawa, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Muffler device for motorcycle. 5,183,130, Cl. 180-219.000.
Nakamura, Mitsuo: *See*—
Utsunomiya, Atsushi; Nakamura, Mitsuo; Kuwatsuka, Toshiaki; and Tanaka, Yoshinori, 5,183,927, Cl. 560-115.000.
Nakamura, Shozo: *See*—
Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.
Nakamura, Takashi: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.
Nakane, Toshio: *See*—
Kawaguichi, Kuniaki; Nakane, Toshio; Shimoda, Akihide; and Hijikata, Kenji, 5,183,623, Cl. 264-544.000.
Nakano, Eiichi, to NEC Corporation. Method of manufacturing semiconductor device. 5,183,781, Cl. 437-191.000.
Nakasima, Masaaki: *See*—
Takahashi, Tadashi; Furuya, Katsuhiko; Nakasima, Masaaki; and Enomoto, Takayuki, 5,184,170, Cl. 354-413.000.
Nakata, Tomohiro; and Mizuta, Akira, to Fuji Photo Film Co., Ltd. Method for inspecting magnetic disk cartridge. 5,184,197, Cl. 356-426.000.
Nakatani, Seiichi: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Kitano, Motoi; Nakatani, Yoshio; Yoshida, Hideyuki; Hatta, Toshiya; and Nakatani, Seiichi, 5,183,594, Cl. 252-518.000.
Nakatani, Yoshio: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Kitano, Motoi; Nakatani, Yoshio; Yoshida, Hideyuki; Hatta, Toshiya; and Nakatani, Seiichi, 5,183,594, Cl. 252-518.000.
Nakayama, Shoichiro: *See*—
Noguchi, Shigeru; Ishida, Satoshi; Iwata, Hiroshi; Sano, Keiichi; and Nakayama, Shoichiro, 5,183,780, Cl. 437-173.000.
Nalco Chemical Company: *See*—
Malito, John T.; and Layman, Curtis M., 5,183,211, Cl. 241-16.000.
Namur, Marc. Dagger board storage housing for sailboards. 5,183,367, Cl. 441-79.000.
Nania, Yves, to Renolux. Child automobile seat with flange revolving upon arched ribs. 5,183,312, Cl. 297-250.000.
Nappholz, Tibor A.; Koestner, Ken; and Valenta, Harry L., Jr., to Telectronics Pacing Systems, Inc. Apparatus and method for detecting abnormal cardiac rhythms using an ultrasound sensor in an arrhythmia control system. 5,183,040, Cl. 128-419.0PG.

Narimatsu, Osamu: *See*—
Takemura, Yasuo; Narimatsu, Osamu; and Komatsu, Kazuyoshi, 5,183,699, Cl. 428-214.000.
Narita, Tomohiro: *See*—
Ito, Masayoshi; Yamada, Kiichi; Otake, Katsunori; Miyata, Yasunobu; Narita, Tomohiro; and Nishikawa, Susumu, 5,183,128, Cl. 180-197.000.
Narukami, Toshihiko: *See*—
Taga, Kazumitsu; Narukami, Toshihiko; and Miyaoku, Yoshiyuki, 5,183,678, Cl. 426-448.000.
National Computer Systems, Inc.: *See*—
McMillin, John V.; and Clark, Jay V., 5,184,003, Cl. 235-454.000.
National Gypsum Company: *See*—
Zak, James L.; and Smith, Richard E., 5,183,152, Cl. 206-524.400.
National Research Development Corporation: *See*—
Bateman, Colin N.; Clark, Peter L.; and Carter, William G., 5,182,886, Cl. 52-125.600.
National Semiconductor Corporation: *See*—
Ohannes, James R.; Clukey, Stephen W.; Haacke, Ernest D.; and Yarbrough, Roy L., 5,184,034, Cl. 307-473.000.
Nau, Vance J.: *See*—
Gatten, Ronald A.; Miller, Leslie A.; McCall, Thomas J., Jr.; and Nau, Vance J., 5,183,486, Cl. 55-159.000.
Navar, Cynthia A.: *See*—
Fjare, Douglas E.; Beuhler, Allyson J.; and Navar, Cynthia A., 5,183,534, Cl. 156-668.000.
Navigation Technology Corporation: *See*—
Dumestre, Alex, III, 5,184,328, Cl. 367-4.000.
Navistar International Transportation Corp.: *See*—
Stasell, Mark W., 5,184,301, Cl. 364-431.070.
Nawoj, John P. Child commode seat apparatus. 5,182,818, Cl. 4-235.000.
Naya, Toshiaki: *See*—
Ohta, Norio; Oda, Yukio; Naya, Toshiaki; and Kasuga, Tomoyuki, 5,183,026, Cl. 125-11.160.
NCR Corporation: *See*—
Nicoll, Kenneth A., 5,183,140, Cl. 192-56.00R.
NEC Corporation: *See*—
Henmi, Naoya; Suzaki, Tetsuyuki; and Saito, Tomoki, 5,184,243, Cl. 359-181.000.
Nagafuji, Toshiaki, 5,183,412, Cl. 439-578.000.
Nakano, Eiichi, 5,183,781, Cl. 437-191.000.
Sugibayashi, Tadahiko, 5,184,035, Cl. 307-482.000.
Sukegawa, Osamu, 5,184,235, Cl. 359-60.000.
Taniguchi, Hiromichi, 5,184,287, Cl. 361-540.000.
Yamashita, Shuji, 5,184,242, Cl. 359-177.000.
Negayama, Naomi: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.
Negoro, Kouichi: *See*—
Matsuoka, Fumio; Negoro, Kouichi; Sugimoto, Takeshi; Yamaguchi, Toshiaki; and Yamashita, Tetsuya, 5,182,920, Cl. 62-206.000.
Neill, Eugene B.: *See*—
Hergert, Richard E.; Hergert, Richard R.; Neill, Eugene B.; Pantaleo, Scott B.; Roerig, Arnold J.; Rogers, Thomas D.; Shands, Jay A.; and Takeguchi, Noriaki, 5,183,537, Cl. 162-216.000.
Neis, George Glenn: *See*—
Paplinski, Walter, 5,183,284, Cl. 280-508.000.
Nelb, Robert G., II; and Onder, Kemal, to Dow Chemical Company, The. Polyamide blends by reactive processing. 5,183,864, Cl. 525-452.000.
Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Position measuring apparatus. 5,182,867, Cl. 33-702.000.
Nelson, Larry A., to Honeywell Inc. Apparatus and method for testing an active matrix pixel display. 5,184,082, Cl. 324-537.000.
Neotronics Medical Limited: *See*—
Dearman, Peter T., 5,183,037, Cl. 128-204.180.
Nergeco (societe anonyme): *See*—
Kraeutler, Bernard, 5,183,093, Cl. 160-84.100.
Nesler, Clay: *See*—
Decious, Gaylon; and Nesler, Clay, 5,184,122, Cl. 340-870.160.
Neste Oy: *See*—
Knuuttila, Hilkka; and Lakomaa, Eeva-Liisa, 5,183,794, Cl. 502-242.000.
Knuuttila, Pekka; and Lakomaa, Eeva-Liisa, 5,183,796, Cl. 502-340.000.
Nestec S.A.: *See*—
Carns, Lawrence G.; and Tuot, James, 5,182,926, Cl. 62-352.000.
Schlecht, Klaus, 5,183,676, Cl. 426-434.000.
Neugebauer, Constantine A.; Glascock, Homer H., II; Paik, Kyung W.; McMullen, James G.; and Neugebauer, Martha M., to General Electric Company. Direct thermocompression bonding for thin electronic power chips. 5,184,206, Cl. 257-762.000.
Neugebauer, Martha M.: *See*—
Neugebauer, Constantine A.; Glascock, Homer H., II; Paik, Kyung W.; McMullen, James G.; and Neugebauer, Martha M., 5,184,206, Cl. 257-762.000.
Neuvessel, Jacques: *See*—
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Nevamar Corporation: *See*—
Scher, Herbert I.; Ungar, Israel S.; and Baehr, Richard R., Jr., 5,183,600, Cl. 264-26.000.
Neveu, Frederic: *See*—
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New Jersey Machine Inc.: *See*—
Reuteler, Urs, 5,183,146, Cl. 198-444.000.
New Morning Windows, Inc.: *See*—
Berge, Richard H., Jr.; and Larsen, Mark A., 5,182,880, Cl. 49-504.000.
Newallis, Peter E.: *See*—
Zakaryan, Ara H.; Newallis, Peter E.; and Tice, Mark A., 5,183,916, Cl. 558-95.000.
Newell, Catherine D.: *See*—
Mosehauer, Michael; Newell, Catherine D.; and Mauer, Andrew J., 5,184,194, Cl. 355-297.000.
Newton, David F.: *See*—
Kenyon, Ronald W.; Newton, David F.; and Thorp, Derek, 5,183,888, Cl. 544-153.000.
Next Computer, Inc.: *See*—
Molpus, J. Lane; Levinthal, Adam; and Werner, Ross, 5,184,124, Cl. 341-50.000.
NGK Insulators, Ltd.: *See*—
Miyahara, Kazuhiro, 5,183,609, Cl. 264-44.000.
Takeuchi, Yukihisa; Hirota, Toshikazu; Okada, Shigeki; and Shimogawa, Natsumi, 5,184,344, Cl. 369-126.000.
Nguyen, Hop D.: *See*—
Hull, Charles W.; Spence, Stuart T.; Albert, David J.; Smalley, Dennis R.; Harlow, Richard A.; Stinebaugh, Phil; Tarnoff, Harry L.; Nguyen, Hop D.; Lewis, Charles W.; Vorgitch, Tom J.; and Remba, David Z., 5,184,307, Cl. 364-474.240.
Nguyen, My N.; Lee, Chee-Kong; and Herrington, Thomas L., to Johnson Matthey Inc. Silver-glass pastes. 5,183,784, Cl. 501-19.000.
Niagara Mohawk Power Corporation: *See*—
Barker, Philip P., 5,184,215, Cl. 358-93.000.
Nichols, Charles R.: *See*—
Woodall, Bobbie L.; Nichols, Charles R.; and Nichols, Thelma E., 5,182,956, Cl. 74-18.200.
Nichols, Robert L. Medical instrument sterilization container. 5,183,643, Cl. 422-297.000.
Nichols, Thelma E.: *See*—
Woodall, Bobbie L.; Nichols, Charles R.; and Nichols, Thelma E., 5,182,956, Cl. 74-18.200.
Nicholson, James C.: *See*—
Bryant, David R.; Babin, James E.; Nicholson, James C.; and Weintritt, Donald J., Jr., 5,183,943, Cl. 568-454.000.
Nicholson, Jamie: *See*—
McEachern, Alexander; Nicholson, Jamie; and Waterman, Craig S., 5,184,066, Cl. 324-158.00R.
Nickolas, Sarento G.: *See*—
Dalla Betta, Ralph A.; Ezawa, Nobuyasu; Tsurumi, Kazunori; Schlatter, James C.; and Nickolas, Sarento G., 5,183,401, Cl. 431-7.000.
Nicolaou, Kyriacos C.; Sorensen, Erik; Hwang, Chan-Kou; Discordia, Robert; Bergman, Robert G.; and Minto, Robert E., to Scripps Research Institute, The. Ten-membered ring enediynediols and enediynediones having DNA cleaving properties. 5,183,942, Cl. 568-375.000.
Nicolas, Michel: *See*—
Guillin, Daniel; and Nicolas, Michel, 5,183,076, Cl. 137-513.700.
Nicolet Instrument Corporation: *See*—
Ladwig, Gregory J., 5,184,062, Cl. 324-74.000.
Nicoll, Kenneth A., to NCR Corporation. Torque limiting mechanism for use in a drive system. 5,183,140, Cl. 192-56.00R.
Niehcus, Gottfried: *See*—
Meier, Josef; and Niehaus, Gottfried, 5,183,176, Cl. 220-470.000.
Nigo, Toshiro: *See*—
Iida, Tadasato; Takahashi, Fusakichi; Wada, Kouji; and Nigo, Toshiro, 5,182,915, Cl. 62-89.000.
Niho, Yoji G.; Day, Eric W.; and Flanders, Tammy L., to Hughes Aircraft Company. Fast phase difference autofocus. 5,184,134, Cl. 342-25.000.
Nihonmatai Co., Ltd.: *See*—
Noguchi, Tatsuo, 5,183,432, Cl. 446-220.000.
Nikon Corporation: *See*—
Iida, Yoshikazu; Kosaka, Toru; Tsuru, Hiroyuki; Higaki, Riichi; and Katayama, Akira, 5,184,167, Cl. 354-403.000.
Nakagawa, Masahiro; Mizutani, Hideo; Komatsu, Kouichirou; and Nojima, Yawara, 5,184,196, Cl. 356-401.000.
Nilsson, Kenth-Ake-Sune: *See*—
Dalen, Bjoern; Nilsson, Kenth-Ake-Sune; Hoegnelid, Kurt; and Wecke, Liliane, 5,183,056, Cl. 128-782.000.
Nioche, Jean-Yves: *See*—
Festal, Didier; Nioche, Jean-Yves; Descours, Denis; Bellemin, Robert; and Decerprit, Jacques, 5,183,924, Cl. 560-56.000.
Nippon Aleph Corporation: *See*—
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Nippon Chemiphar Co., Ltd.: *See*—
Masaki, Mitsuo; Takeda, Hiromitsu; Kamishiro, Toshiro; and Yamamoto, Masao, 5,183,811, Cl. 514-79.000.
Nippon Conlux Co., Ltd.: *See*—
Kachi, Kenjiro; and Noda, Kazuo, 5,184,340, Cl. 369-44.370.
Nippon Oil and Fats Co., Ltd.: *See*—
Kuroyama, Yutaka; Maeno, Masami; and Sakakibara, Ikuo, 5,183,362, Cl. 407-118.000.

Nippon Paint Co., Ltd.: *See*—
Kishi, Hiroyuki; Kimura, Hitoshi; Yamamoto, Katsuya; Tamura, Yoshinobu; Sakauchi, Tsuneo; Nagaoka, ;Masahide; and Tsuchiya, Yasuyu, 5,183,836, Cl. 523-404.000.
Kuwajima, Teruaki; Umeda, Shinichiro; and Konishi, Sakuichi, 5,183,504, Cl. 106-404.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Ouchi, Hideo; and Miyazaki, Hiroya, 5,183,341, Cl. 384-446.000.
Nippon Steel Corporation: *See*—
Nakamura, Masanori; Hirakouchi, Hiroshi; Yatsuka, Takeshi; Kadowaki, Nobuo; and Endoh, Hiroshi, 5,183,863, Cl. 525-438.000.
Tamehiro, Hiroshi; Ogata, Yoshinori; and Terada, Yoshio, 5,183,198, Cl. 228-186.000.
Nippondenso Co. Ltd.: *See*—
Ukai, Naoki; and Mori, Koji, 5,184,005, Cl. 235-472.000.
Nishi, Kunihiko: *See*—
Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.
Nishi, Norio: *See*—
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Nishi, Yuji; Ito, Shigehiro; Kuguchi, Tatsushi; and Ebihara, Kazuyuki, to Victor Company of Japan, Ltd. Apparatus for removing ghost component disturbing picture signal. 5,184,221, Cl. 358-167.000.
Nishida, Hiroshi: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.
Nishida, Kuniyoshi: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shinomoto, Shoji; and Nagai, Masahiko, 5,183,921, Cl. 558-301.000.
Nishide, Tsutomu; Yasumura, Daisuke; Nakajima, Yoshinobu; Onodera, Akiko; Yasukawa, Takuji; Kokumai, Hirokazu; Umeda, Tomoshige; Nomura, Seiji; and Mori, Hideki, to Kao Corporation. Processes for the production of phosphatidic acid. 5,183,750, Cl. 435-134.000.
Nishigaki, Takayuki: *See*—
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Nishikawa, Kohei: *See*—
Naka, Takehiko; and Nishikawa, Kohei, 5,183,899, Cl. 548-253.000.
Nishikawa, Susumu: *See*—
Ito, Masayoshi; Yamada, Kiichi; Otake, Katsunori; Miyata, Yasunobu; Narita, Tomohiro; and Nishikawa, Susumu, 5,183,128, Cl. 180-197.000.
Nishimura, Akira; Suzuki, Shuzo; and Shigematsu, Masayuki, to Sumitomo Electric Industries, Ltd. Optical communication system and communication method. 5,184,244, Cl. 359-187.000.
Nishimura, Hiroshi, to Hitachi Medical Corporation. Method and apparatus for compensating for nonuniformity of static magnetic field in MRI system. 5,184,075, Cl. 324-309.000.
Nishino, Hiromi; Tarui, Keiji; Toyoshi, Hideyuki; and Morita, Tatsuo, to Sharp Kabushiki Kaisha. Electrode pattern forming method. 5,183,725, Cl. 430-313.000.
Nishio, Kouji; and Hanamura, Yoshihiko, to Kabushiki Kaisha Topcon. Noncontact type tonometer. 5,183,044, Cl. 128-648.000.
Nishio, Maki: *See*—
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,183,808, Cl. 514-33.000.
Nishitani, Yasuhiro, to Fuji Photo Film Co., Ltd. Photography mode input systems. 5,184,169, Cl. 354-412.000.
Nissan Design International, Inc.: *See*—
Mrozowski, Joseph E.; Fusco, Jeffery K.; and Albaisa, Alfonso, 5,183,192, Cl. 224-42.210.
Nissan Motor Co., Ltd.: *See*—
Ikeda, Hiroshi, 5,184,131, Cl. 341-165.000.
Imaseki, Takashi; Tamura, Minoru; Iwata, Toru; and Fukuyama, Yuichi, 5,184,298, Cl. 364-424.050.
Kishi, Hiroyuki; Kimura, Hitoshi; Yamamoto, Katsuya; Tamura, Yoshinobu; Sakauchi, Tsuneo; Nagaoka, ;Masahide; and Tsuchiya, Yasuyu, 5,183,836, Cl. 523-404.000.
Masuhra, Shohei; Tonoki, Satoshi; Shibukawa, Toshiya; and Sugawara, Hirsohi, 5,183,695, Cl. 428-151.000.
Mihara, Teruyoshi; Matsushita, Tsutomu; Yao, Kenji; Hoshi, Masakatsu; Enokido, Yutaka; and Hirota, Yukitsugu, 5,184,204, Cl. 357-629.000.
Naito, Genpei, 5,183,131, Cl. 180-233.000.
Nisshin Oil Mills, Ltd., The: *See*—
Tamura, Koichi; Taguchi, Nobuo; and Tashiro, Satoshi, 5,183,675, Cl. 426-33.000.
Nisshinbo Industries, Inc.: *See*—
Yosomiya, Ryutoku; Hirata, Mistutoshi; Morimoto, Kiyotaka; Takenishi, Soichiro; and Marutsuka, Toshinori, 5,183,611, Cl. 264-129.000.
Nitta, Atsumi: *See*—
Kanai, Yasushi; Takano, Hiroe; Saoshita, Shushi; and Nitta, Atsumi, 5,184,266, Cl. 360-120.000.
Nitto Denko Corporation: *See*—
Hori, Mitsuhiko, 5,183,665, Cl. 424-449.000.
NKK Corporation: *See*—
Ariyama, Tatsuro; Isozaki, Shinichi; Yamada, Kenzo; Matsuo, Masahiro; and Kanatani, Genji, 5,183,495, Cl. 75-379.000.
Nobbe, Paul J. Wooden pole bender. 5,183,091, Cl. 144-360.000.
Nobi, Josef. Bumper bowling game with gravity released ball projector. 5,183,261, Cl. 273-38.000.
Nobis, Dieter: *See*—
Guse, Rudolf; Nobis, Dieter; and Malinowski, Hans, 5,182,847, Cl. 29-527.700.
Noda, Kazuo: *See*—
Kachi, Kenjiro; and Noda, Kazuo, 5,184,340, Cl. 369-44.370.
Noda, Kousuke: *See*—
Hamada, Yasunori; Oizumi, Junichi; Noda, Kousuke; and Ushijima, Kunio, 5,184,000, Cl. 235-379.000.
Noe, Andreas: *See*—
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 5,182,931, Cl. 72-183.000.
Noe, Oskar; Noe, Rolf; and Noe, Andreas, to BWG Bergwerk-und Walzwerk Maschinenbau GmbH. Method for continuous tension stretching of thin strips, particularly metal strips. 5,182,931, Cl. 72-183.000.
Noe, Rolf: *See*—
Noe, Oskar; Noe, Rolf; and Noe, Andreas, 5,182,931, Cl. 72-183.000.
Nogami, Akira: *See*—
Mikami, Toshihiro; Kohmura, Yukio; Ishida, Yoshinori; and Nogami, Akira, 5,183,490, Cl. 65-144.000.
Noguchi, Hideaki, to Sony Corporation. Various-sized-cassette housing shelf. 5,184,261, Cl. 360-94.000.
Noguchi, Shigeru; Ishida, Satoshi; Iwata, Hiroshi; Sano, Keiichi; and Nakayama, Shoichiro, to Sanyo Electric Co., Ltd. Method of fabricating semiconductor device. 5,183,780, Cl. 437-173.000.
Noguchi, Tatsuo, to Nihonmatai Co., Ltd. Floating body of sophisticated shape produced from a single sheet of film with a single sealing. 5,183,432, Cl. 446-220.000.
Noguchi, Yukio: *See*—
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, 5,184,166, Cl. 354-400.000.
Nojima, Yawara: *See*—
Nakagawa, Masahiro; Mizutani, Hideo; Komatsu, Kouichirou; and Nojima, Yawara, 5,184,196, Cl. 356-401.000.
NOK Corporation: *See*—
Saitoh, Takayuki, 5,183,617, Cl. 264-249.000.
Wada, Noriyuki; and Nishigaki, Takayuki, 5,183,271, Cl. 277-152.000.
Noltee, Dennis E., Sr.: *See*—
Ashelin, Brian T.; Bergquist, Mark A.; and Noltee, Dennis E., Sr., 5,184,284, Cl. 361-400.000.
Nomura, Seiji: *See*—
Nishide, Tsutomu; Yasumura, Daisuke; Nakajima, Yoshinobu; Onodera, Akiko; Yasukawa, Takuji; Kokumai, Hirokazu; Umeda, Tomoshige; Nomura, Seiji; and Mori, Hideki, 5,183,750, Cl. 435-134.000.
Nomura, Tomoko: *See*—
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,183,824, Cl. 514-383.000.
Nonaka, Osamu, to Olympus Optical Co., Ltd. Distance measuring apparatus for camera, which controls outputs from multi-electrodes PSD. 5,184,168, Cl. 354-403.000.
Nordquest, Kim W., to Phillips Petroleum Company. Olefin polymerization over pi-olefin complex of chromium supported on aluminophosphate. 5,183,868, Cl. 526-155.000.
Nordson Corporation: *See*—
Merkel, Stephen L., 5,182,938, Cl. 73-19.050.
Nordstrom, Immo R.; and Bak, Johannes A. Method and apparatus for handling cargo containers. 5,183,305, Cl. 294-81.200.
Norlander, Norman E.; and Thompson, Ralph A., to Weyerhaeuser Company. Chipper knife assembly. 5,183,089, Cl. 144-231.000.
North, John M., to Gould Electronics Limited; and Dowty Electronic Components Limited. Solid state cell electrolyte. 5,183,715, Cl. 429-192.000.
North, Peter C.: *See*—
Coates, Ian H.; Oxford, Alexander W.; North, Peter C.; and Price, Barry J., 5,183,820, Cl. 514-292.000.
Northern Telecom Europe: *See*—
Oswald, Thomas; and Hirst, Ian J., 5,184,081, Cl. 324-533.000.
Notoya, Kohei; Yoshida, Keiji; and Yamazaki, Iwao, to Takeda Chemical Industries, Ltd. Process for preparing osteogenesis promoting substance. 5,183,570, Cl. 210-641.000.
Novotny, Shlomo D., to Digital Equipment Corporation. Closed-cycle expansion-valve impingement cooling system. 5,183,104, Cl. 165-104.330.
Nozaki, Ryoei: *See*—
Kose, Junichi; Sugiyama, Akira; Yamada, Minoru; and Nozaki, Ryoei, 5,184,164, Cl. 354-298.000.
Nozokido, Tatsuo: *See*—
Takeuchi, Hiroyuki; Nozokido, Tatsuo; and Nakamura, Chikako, 5,184,073, Cl. 324-309.000.
Nozuyama, Yasuyuki, to Kabushiki Kaisha Toshiba. Signature compression circuit. 5,184,067, Cl. 324-158.00R.
NTN Technical Center, (U.S.A.) Inc.: *See*—
Adler, Jonathan M.; Monahan, Russell E.; and Frayer, Robert W., Jr., 5,184,069, Cl. 324-207.220.
Nukem GmbH: *See*—
Brandau, Egbert; Huschka, Hans; Kadner, Martin; and Schroder, Waldemar, 5,183,493, Cl. 75-335.000.

Numata, Shunichi: *See*—
Miwa, Takao; Ikeda, Takayoshi; Numata, Shunichi; Fujisaki, Koji; and Shimanoki, Hisae, 5,183,838, Cl. 524-109.000.

Nunley, Alvin, III: *See*—
Adams, James W.; Loving, Louis S.; Betts, David A.; Donnelly, David P.; and Nunley, Alvin, III, 5,184,330, Cl. 367-111.000.

Nunn, Adrian D.: *See*—
Linder, Karen E.; Nunn, Adrian D.; and Ramalingam, Kondareddiar, 5,183,653, Cl. 424-1.100.

NutraSweet Company, The: *See*—
Johnson, Mark R., 5,183,937, Cl. 562-608.000.

N.V. Michel Van de Wiele: *See*—
Debaes, John, 5,183,083, Cl. 139-449.000.

O Breartuin, Ciaran S., to Emerson Electric Co. Isolation circuit for detecting the state of a line connected switch. 5,184,026, Cl. 307-139.000.

O'Callaghan, John S.: *See*—
Patuszynski, Duane R.; O'Callaghan, John S.; and Bartoli, Andrew, 5,182,991, Cl. 101-216.000.

Ochi, Katsunori: *See*—
Kodai, Shojiro; Ochi, Katsunori; and Baba, Fumiaki, 5,184,209, Cl. 257-679.000.

Oda, Yukio: *See*—
Ohta, Norio; Oda, Yukio; Naya, Toshiaki; and Kasuga, Tomoyuki, 5,183,026, Cl. 125-11.160.

O'Daniel, Harold W. Extendable rolloff trailer. 5,183,371, Cl. 414-477.000.

Odashima, Satoshi, to Shin-Etsu Polymer Co., Ltd. Anisotropically electroconductive adhesive and adhesively bonded structure therewith. 5,183,969, Cl. 174-88.00R.

O'Dowd, Ronan F. De-multiplexer. 5,184,240, Cl. 359-135.000.

O'Fearna, Patrick J. Hose bibb closure. 5,182,928, Cl. 70-232.000.

Ogata, Hisanao: *See*—
Ogushi, Tetsuya; Hakuraku, Yoshinori; and Ogata, Hisanao, 5,183,799, Cl. 505-1.000.

Ogata, Yoshinori: *See*—
Tamehiro, Hiroshi; Ogata, Yoshinori; and Terada, Yoshio, 5,183,198, Cl. 228-186.000.

Ogawa, Kazunori, to Teijin Seiki Co., Ltd. Counterbalance valve. 5,183,071, Cl. 137-106.000.

Ogawa, Masao: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.

Ogawa, Takayuki: *See*—
Sakata, Shinji; Miyashita, Takanori; Kondo, Kazuhiko; Sakai, Atsushi; Shibata, Toshiyuki; and Ogawa, Takayuki, 5,183,882, Cl. 514-49.000.

Ogino, Kazuya: *See*—
Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, 5,183,501, Cl. 106-22.00D.

Ogino, Mineo: *See*—
Kozaki, Takahiko; Asano, Kenichi; Ogino, Mineo; Amada, Eiichi; Endo, Noboru; and Sakurai, Yoshito, 5,184,346, Cl. 370-60.000.

Oguchi, Satoshi: *See*—
Sakuta, Toshiyuki; Miyazawa, Kazuyuki; Oguchi, Satoshi; Kaneda, Aizo; Mitani, Masao; Nakamura, Shozo; Nishi, Kunihiko; and Murakami, Gen, 5,184,208, Cl. 257-666.000.

Ogushi, Tetsuya; Hakuraku, Yoshinori; and Ogata, Hisanao, to Hitachi, Ltd. Superconducting materials including La-Sr-Nb-O, Y-Ba-Nb-O, La-Sr-Nb-Cu-O, and Y-Ba-Nb-Cu-O. 5,183,799, Cl. 505-1.000.

Ohannes, James R.; Clukey, Stephen W.; Haacke, Ernest D.; and Yarbrough, Roy L., to National Semiconductor Corporation. State-dependent discharge path circuit. 5,184,034, Cl. 307-473.000.

Ohashi, Yutaka: *See*—
Fukui, Wataru; Iwata, Toshio; Ohashi, Yutaka; and Ikeuchi, Masayuki, 5,182,943, Cl. 73-116.000.

Ohgi Paint Trading Co., Ltd.: *See*—
Takeishi, Hideo; Houseki, Sigeki; and Matsubara, Isao, 5,183,210, Cl. 239-703.000.

Ohi, Tamio: *See*—
Akahoshi, Sumihisa; Akimura, Hitoshi; Nakabayashi, Isao; Ishii, Masami; Ohi, Tamio; and Yoshida, Makoto, 5,183,591, Cl. 252-503.000.

Ohishi, Shinji; Akutsu, Kotaro; and Sakai, Toshikazu, to Canon Kabushiki Kaisha. Device for positioning control. 5,184,055, Cl. 318-615.000.

Ohki, Konomu: *See*—
Ohta, Yutaka; Ohki, Konomu; and Katayama, Masatake, 5,183,783, Cl. 437-225.000.

Ohmoto, Hiroshi; and Iwamoto, Seiichi, to Kanebo, Ltd. Anti-human papillomavirus monoclonal antibody, hybridoma producing the same and process for preparing the same. 5,183,755, Cl. 435-240.270.

Ohsono, Kouhei: *See*—
Yumoto, Toshiyuki; Ohsono, Kouhei; Kanda, Masahiro; and Matsuda, Takahiro, 5,183,439, Cl. 474-28.000.

Ohta, Mituhiro: *See*—
Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, 5,183,501, Cl. 106-22.00D.

Ohta, Norio; Oda, Yukio; Naya, Toshiaki; and Kasuga, Tomoyuki, to Toyoda Koki Kabushiki Kaisha. Method and apparatus for dressing an angular grinding wheel. 5,183,026, Cl. 125-11.160.

Ohta, Yoshiji, to Sharp Kabushiki Kaisha. Dynamic semiconductor multi-value memory device. 5,184,324, Cl. 365-149.000.

Ohta, Yutaka; Ohki, Konomu; and Katayama, Masatake, to Shin-Etsu Handotai Co., Ltd. Method for production of dielectric-separation substrate. 5,183,783, Cl. 437-225.000.

Ohtani, Mitsuaki; and Matsuura, Takaharu, to Shionogi & Company, Ltd. Mono ester of dicarboxylic acid. 5,183,909, Cl. 549-463.000.

Ohtori, Akira: *See*—
Morita, Yasushi; Ohtori, Akira; and Andoh, Masako, 5,183,662, Cl. 424-426.000.

Ohtsuna, Hiroshi: *See*—
Baba, Masahiko; and Ohtsuna, Hiroshi, 5,183,528, Cl. 156-601.000.

Ohyama, Tsukasa; Shimokawa, Yasushi; Ghoda, Isamu; Takuma, Keisuke; and Koshida, Hitoshi, to Mitsui Toatsu Chemicals Inc. Heat-sensitive sublimation transfer cyan dye and transfer sheet. 5,183,474, Cl. 8-471.000.

Oike, Hiroshi; and Kawamoto, Akira, to Kabushiki Kaisha Toshiba. Automatic ice maker and household refrigerator equipped therewith. 5,182,916, Cl. 62-135.000.

Oishi, Kengo: *See*—
Mizuno, Masato; and Oishi, Kengo, 5,184,268, Cl. 360-132.000.

Oizumi, Junichi: *See*—
Hamada, Yasunori; Oizumi, Junichi; Noda, Kousuke; and Ushijima, Kunio, 5,184,000, Cl. 235-379.000.

Oka, Koichi: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.

Okabe, Takanori: *See*—
Aoki, Shinobu; Takagi, Haruo; and Okabe, Takanori, 5,184,201, Cl. 257-266.000.

Okada, Hiromi; and Otsuka, Masao, to Mita Industrial Co., Ltd. Sheet feeding device. 5,183,248, Cl. 271-127.000.

Okada, Shigeki: *See*—
Takeuchi, Yukihisa; Hirota, Toshikazu; Okada, Shigeki; and Shimogawa, Natsumi, 5,184,344, Cl. 369-126.000.

Okajima, Yasuo: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.

Okamoto, Haruo. Folder type paper box. 5,183,200, Cl. 229-23.00R.

Okamoto, Hidefumi; and Sengoku, Koji, to House Food Industrial Co., Ltd. Method for preparing retort Tofu. 5,183,681, Cl. 426-634.000.

Okamoto, Rokuro: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.

Okamoto, Yuji: *See*—
Morooka, Toru; and Okamoto, Yuji, 5,183,240, Cl. 271-3.100.

Okawa, Tadashi, to Dow Corning Toray Silicone Co., Ltd. Organopentasiloxane and method for its preparation. 5,183,912, Cl. 556-425.000.

Okawauchi, Makoto: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.

OKI Electric Industry Co., Ltd.: *See*—
Kikuchi, Hiroshi; Nakajima, Shigeki; Ono, Hisao; and Momiyama, Yoshiharu, 5,184,177, Cl. 355-200.000.

Oki, Toshikazu: *See*—
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, 5,183,808, Cl. 514-33.000.

Okinaka, Hideyuki: *See*—
Gejima, Seiji; Kawakita, Koji; Kimura, Suzushi; Okinaka, Hideyuki; and Hakotani, Yasuhiko, 5,183,786, Cl. 501-134.000.

Okita, Kazumasa: *See*—
Uesaka, Kazuo; Okita, Kazumasa; and Arai, Tsutomu, 5,183,656, Cl. 424-76.100.

Okitsumo Incorporated: *See*—
Uesaka, Kazuo; Okita, Kazumasa; and Arai, Tsutomu, 5,183,656, Cl. 424-76.100.

Oku, Mitsumasa: *See*—
Yoshinaka, Minoru; Asakura, Eizo; Oku, Mitsumasa; Kitano, Motoi; Nakatani, Yoshio; Yoshida, Hideyuki; Hatta, Toshiya; and Nakatani, Seiichi, 5,183,594, Cl. 252-518.000.

Okubo, Hideo: *See*—
Yamaguchi, Seiji; Moro, Masaru; Kajikawa, Saburou; Kimura, Masahiro; Okubo, Hideo; Matsuyo, Tadashi; and Kawakami, Hiroshi, 5,182,833, Cl. 15-319.000.

Okuma, Shigeru; Furuhashi, Takeshi; Ikejima, Hiroyuki; and Ishii, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Linear motor elevator device with a null-flux position adjustment. 5,183,980, Cl. 187-112.000.

Okun, Nathan; and Engberg, John. Optical storage device with a stationary mass storage medium. 5,184,322, Cl. 365-122.000.

Okunosono, Toshihiko: *See*—
Nakamura, Michio; Okunosono, Toshihiko; and Kajikawa, Tsuneo, 5,183,130, Cl. 180-219.000.

O'Lenick, Anthony J., Jr.: *See*—
Parkinson, Jeff; and O'Lenick, Anthony J., Jr., 5,183,845, Cl. 524-726.000.

Olexy, Anthony M.: *See*—
Daniels, Steven D.; Bedzyk, Mark D.; Brahm, Roger S.; and Olexy, Anthony M., 5,184,153, Cl. 346-108.000.

Olin Corporation: *See*—
Campoli, Ralph F.; and McGovern, John T., 5,183,961, Cl. 102-439.000.

Olin, Thomas. Food and feedstuff. 5,183,674, Cl. 426-2.000.

Oliver, Thomas C.: *See*—
Wanger, Mark E.; Methlie, Jennifer L.; Stavely, Donald J.; and Oliver, Thomas C., 5,184,336, Cl. 369-34.000.

Olla, Michael A.: *See*—
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,182,851, Cl. 29-827.000.

Olson, George E.: *See*—
Amberson, James R.; Ehlert, William C.; and Olson, George E., 5,182,883, Cl. 52-73.000.

Olsson, Lennart F.: *See*—
Wierman, Michael J.; and Olsson, Lennart F., 5,183,149, Cl. 198-778.000.

Olympus Optical Co., Ltd.: *See*—
Mihara, Shinichi, 5,184,223, Cl. 358-209.000.
Miyauchi, Yuji; Yoshii, Shinichi; and Kanamori, Tatsuru, 5,184,252, Cl. 359-715.000.
Nonaka, Osamu, 5,184,168, Cl. 354-403.000.
Rokutan, Takao, 5,184,337, Cl. 369-44.250.
Tsuchida, Hirofumi; and Aoki, Norihiko, 5,184,251, Cl. 359-654.000.
Yamamoto, Mitsunori, 5,184,012, Cl. 250-234.000.

Omega Engineering, Inc.: *See*—
Hollander, Milton B.; Jacobs, David R.; and McKinley, William E., 5,183,420, Cl. 439-457.000.
Pyzik, Thomas E., 5,182,952, Cl. 73-861.790.

Omnitron International, Inc.: *See*—
Hayman, Michael H.; Morgan, Lee R.; and Liprie, Samuel F., 5,183,455, Cl. 600-7.000.

Omoto, Kouichi; and Miyazaki, Takeshi, to Dai Nippon Insatsu Kabushiki Kaisha. Test device for detecting glucose, protein urobilinogen, and/or occult blood in body fluids and/or determining the PH thereof. 5,183,742, Cl. 435-14.000.

Omron Tateisi Electronics Co.: *See*—
Toriu, Mamoru; and Kitamura, Mitsuru, 5,183,041, Cl. 128-421.000.

Onder, Kemal: *See*—
Nelb, Robert G., II; and Onder, Kemal, 5,183,864, Cl. 525-452.000.

Ondeyka, John G.: *See*—
Bills, Gerald F.; Hensens, Otto D.; Koupal, Lawrence; Lingham, Russell B.; Ondeyka, John G.; and Zink, Deborah L., 5,183,826, Cl. 514-411.000.

O'Neil, Robert M.; Phillips, Emyr; and Wasson, Robert C., to Ciba-Geigy Corporation. Method of producing an organic, corrosion-resistant surface coating. 5,183,842, Cl. 524-288.000.

Onishi, Shigeo; Yamadai, Tsutomu; and Ishihara, Kazuya, to Sharp Kabushiki Kaisha. Process for fabricating a semiconductor device including a tungsten silicide adhesive layer. 5,183,782, Cl. 437-192.000.

Onishi, Shigeo: *See*—
Ayukawa, Akitsu; and Onishi, Shigeo, 5,183,770, Cl. 437-41.000.

Ono, Hisao: *See*—
Kikuchi, Hiroshi; Nakajima, Shigeki; Ono, Hisao; and Momiyama, Yoshiharu, 5,184,177, Cl. 355-200.000.

Ono, Keiichi: *See*—
Ikeda, Yoshiharu; Kai, Yoshiyuki; and Ono, Keiichi, 5,183,660, Cl. 424-94.300.

Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, to Canon Kabushiki Kaisha. Thermal transfer recording apparatus and facsimile apparatus. 5,184,151, Cl. 346-76.0PH.

Onodera, Akiko: *See*—
Nishide, Tsutomu; Yasumura, Daisuke; Nakajima, Yoshinobu; Onodera, Akiko; Yasukawa, Takuji; Kokumai, Hirokazu; Umeda, Tomoshige; Nomura, Seiji; and Mori, Hideki, 5,183,750, Cl. 435-134.000.

Onozuka, Haruo: *See*—
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, 5,184,166, Cl. 354-400.000.

Ooishi, Tsukasa: *See*—
Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,184,327, Cl. 365-201.000.

Ooura, Junichi: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.

Optical Recording Corporation: *See*—
Chu, Ching, 5,184,002, Cl. 235-454.000.

Oren, Yoram; Cohen, Haim; and Soffer, Abraham, to State of Israel, Israel Atomic Energy Commission. Optimized multiporous carbon bed for electrochemical filters. 5,183,546, Cl. 204-290.00R.

Orii, Seiji: *See*—
Unno, Yasuyuki; Orii, Seiji; and Yonekawa, Masami, 5,184,176, Cl. 355-52.000.

Orsan: *See*—
Labovitz, Jeffrey; Guilford, William J.; Fang, Lawrence; and Liang, Yi, 5,183,891, Cl. 544-235.000.

Orscheln Co.: *See*—
Perisho, Randal J.; Heimann, Robert L.; and Soucie, Wayne L., 5,182,963, Cl. 74-512.000.

Orsem: *See*—
Labovitz, Jeffrey; Guilford, William J.; Fang, Lawrence; and Liang, Yi, 5,183,891, Cl. 544-235.000.

Ortho-Dent: *See*—
Kumar, Swadesh, 5,183,388, Cl. 433-19.000.

Ortiz, Pedro R.: *See*—
Rasmussen, David L.; Farrell, Michael E.; and Ortiz, Pedro R., 5,184,185, Cl. 355-308.000.

Ortolano, Ralph J.; Ball, Kenneth A.; and Bowman, Gary, to Southern California Edison. Blade assembling. 5,183,244, Cl. 269-43.000.

Oshima, Junji: *See*—
Sasaki, Ichiro; Oshima, Junji; and Yamada, Minoru, 5,183,858, Cl. 525-308.000.
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Osteen, Mitchell M., to General Electric Company. Luminaire having an improved thermal management arrangement. 5,183,328, Cl. 362-294.000.

Osterman, John C.: *See*—
Markwell, John P.; Versaw, Wayne K.; Osterman, John C.; and Kelley, Philip M., 5,183,752, Cl. 435-196.000.

O'Sullivan, Anthony C.: *See*—
Ramos, Gerado; Ghisalba, Oreste; Schar, Hans-Peter; Frei, Bruno; Maienfisch, Peter; and O'Sullivan, Anthony C., 5,183,749, Cl. 435-119.000.

Oswald, James C.: *See*—
MacLane, Donald B.; Deur, Ted E.; Anderson, Jeffrey J.; Titterington, Donald R.; Oswald, James C.; and Meissner, Richard S., 5,184,147, Cl. 346-1.100.

Oswald, Thomas; and Hirst, Ian J., to Northern Telecom Europe. Fault location. 5,184,081, Cl. 324-533.000.

Otake, Katsunori: *See*—
Ito, Masayoshi; Yamada, Kiichi; Otake, Katsunori; Miyata, Yasunobu; Narita, Tomohiro; and Nishikawa, Susumu, 5,183,128, Cl. 180-197.000.

Otis Elevator Company: *See*—
Sheridan, William G.; and Reiskin, Edward D., 5,183,978, Cl. 187-105.000.
Sheridan, William G.; and Reiskin, Edward D., 5,183,979, Cl. 187-108.000.
Thangavelu, Kandasamy, 5,183,981, Cl. 187-128.000.

Otis Engineering Corporation: *See*—
Gano, John C., 5,183,115, Cl. 166-319.000.
Mashaw, Howard R., Jr.; and Hammett, Robert C., 5,183,114, Cl. 166-319.000.

Otsuka Electronic Co., Ltd.: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.

Otsuka Kagaku Kabushiki Kaisha: *See*—
Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, 5,183,716, Cl. 429-192.000.

Otsuka, Masao: *See*—
Okada, Hiromi; and Otsuka, Masao, 5,183,248, Cl. 271-127.000.

Ottestad, Jack B., to ESCO Corporation. Mounting bracket for a working device. 5,183,316, Cl. 299-69.000.

Otto Industries, Inc.: *See*—
Hawkins, Larry S.; and Beese, Ulrich, 5,183,180, Cl. 220-908.000.

Ouchi, Hideo; and Miyazaki, Hiroya, to Nippon Seiko Kabushiki Kaisha. Speed sensing bearing unit. 5,183,341, Cl. 384-446.000.

Outboard Marine Corporation: *See*—
Remmers, Gregry M., 5,184,080, Cl. 324-392.000.

Overbagh, William H.: *See*—
Jorstad, John L.; Morely, Richard A.; and Overbagh, William H., 5,183,025, Cl. 123-669.000.

Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. Heavy oil catalytic cracking process and apparatus. 5,183,558, Cl. 208-113.000.

Oxford, Alexander W.: *See*—
Coates, Ian H.; Oxford, Alexander W.; North, Peter C.; and Price, Barry J., 5,183,820, Cl. 514-292.000.

Oy Alko AB: *See*—
Lehtomaki, Ilkka; Karinen, Pertti; Bergelin, Risto; and Myllymaki, Olavi, 5,183,677, Cl. 426-436.000.

Oyama, Jun; and Uchida, Naoshi, to Fuji Electric Co., Ltd. Circuit breaker. 5,184,100, Cl. 335-16.000.

Oyama, Takashi: *See*—
Kitajima, Eiji; Oyama, Takashi; Maruden, Eiji; Teraoka, Hirokazu; Yamasaki, Haruki; and Shimizu, Susumu, 5,183,603, Cl. 264-29.200.

Ozaki, Junji: *See*—
Abe, Tsuyoshi; Umezawa, Nobumasa; Fukuzumi, Tatsuo; Uchibori, Katsuyuki; Ozaki, Junji; and Motomura, Hiroharu, 5,183,634, Cl. 420-110.000.

Ozawa, Kenichi; and Suekane, Shinichi, to Stanley Electric Co., Ltd. Switching regulator. 5,184,290, Cl. 363-21.000.

Ozeki, Shoichi: *See*—
Suda, Koichi; Matsuzaki, Hitoshi; Wada, Masayuki; and Ozeki, Shoichi, 5,184,272, Cl. 361-87.000.

Padilla, Paul J.: *See*—
Boughner, Murphy D.; Padilla, Paul J.; and Bowling, Floyd A., 5,182,946, Cl. 73-151.000.

Paech, Ivor N., to Longyear Company. Rod handler apparatus. 5,183,366, Cl. 414-22.520.

Pai, Pei-Lin: *See*—
Ting, Chiu H.; and Pai, Pei-Lin, 5,183,795, Cl. 437-230.000.

Paik, Kyung W.: *See*—
Neugebauer, Constantine A.; Glascock, Homer H., II; Paik, Kyung W.; McMullen, James G.; and Neugebauer, Martha M., 5,184,206, Cl. 257-762.000.

Paiocchi, Maurizio: *See*—
Giordano, Claudio; and Paiocchi, Maurizio, 5,183,935, Cl. 562-469.000.

Pakon, Inc.: *See*—
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Palau, Joseph: *See*—
Bassi, Dario; and Palau, Joseph, 5,183,080, Cl. 139-55.100.

Palm, Erich, to SFS Stadler Holding AG. Rivet fastener with drilling bit. 5,183,357, Cl. 411-29.000.

Palmer, Nicholas C.: *See*—
Lee, Ching-Pang; Rieck, Harold P., Jr.; Palmer, Nicholas C.; and Fargher, David G. W., 5,183,385, Cl. 416-97.00R.

Pan, Yuh-Guo; Chan, Alexander; and Hochman, Lana, to Clairol Incorporated. Hair dye coupler compounds. 5,183,941, Cl. 564-390.000.

Pantaleo, Scott B.: *See*—
Hergert, Richard E.; Hergert, Richard R.; Neill, Eugene B.; Pantaleo, Scott B.; Roerig, Arnold J.; Rogers, Thomas D.; Shands, Jay A.; and Takeguchi, Noriaki, 5,183,537, Cl. 162-216.000.

Pantini, Giovanni: *See*—
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Paparizos, Christos; and Shaw, Wilfrid G., to Standard Oil Company, The. Ammoxidation catalysts and methods for their preparation for use in the production of isophthalonitrile. 5,183,793, Cl. 502-338.000.

Papiernik, Wolfgang: *See*—
Brune, Richard; Papiernik, Wolfgang; and Rochholz, Guenter, 5,184,056, Cl. 318-799.000.

Paplinski, Walter, to Neis, George Glenn, a part interest. Coupling mechanism. 5,183,284, Cl. 280-508.000.

Paradigm Biotechnologies Partnership: *See*—
Kyriacou, Andreas, 5,183,569, Cl. 210-636.000.

Paradise, Ronald Y., to GEC-Marconi Electronic Systems Corp. Phase measurement of received pseudonoise sequence using digital correlation. 5,184,135, Cl. 342-149.000.

Park, James M.; and Stichter, Ralph L. Hydraulic wheel cylinder tool. 5,182,841, Cl. 29-229.000.

Park, James M.: *See*—
Fetterhoff, Gary W.; and Blake, William R., 5,183,672, Cl. 425-304.000.

Parker, Corvin L. Folding and nesting boat. 5,183,002, Cl. 114-353.000.

Parker, Rebecca L., to Moore Business Forms, Inc. Perimeter pressure seal module. 5,183,527, Cl. 156-555.000.

Parker, Robin Z.; and Langhoff, Peter W., to Solar Reactor Technologies, Inc. Fluid absorption receiver for solar radiation. 5,182,912, Cl. 60-641.800.

Parkinson, Jeff; and O'Lenick, Anthony J., Jr., to Siltech Inc. Polymer treatment compositions. 5,183,845, Cl. 524-726.000.

Parmley, Charles L.: *See*—
Bowles, Dale D., Sr.; and Parmley, Charles L., 5,183,994, Cl. 219-387.000.

Partin, Dale L.; and Heremans, Joseph P., to General Motors Corporation. Magnetic field sensor with improved electron mobility. 5,184,106, Cl. 338-32.00R.

Pascal, Andre: *See*—
Gadreau, Jean; and Pascal, Andre, 5,184,103, Cl. 336-84.00C.

Pascal, Roger; and Recher, Gilles, to Salomon S.A. Process for manufacturing a ski. 5,183,618, Cl. 264-257.000.

Pascal, Verrier: *See*—
Thierry, Maurickx; Pascal, Verrier; and Roland, Taillard, 5,183,633, Cl. 420-92.000.

Passemard, Jean R.: *See*—
Villalta, Josue J.; and Passemard, Jean R., 5,183,032, Cl. 128-20.000.

Patchett, Arthur A.: *See*—
Greenlee, William J.; Patchett, Arthur A.; Hangauer, David; Walsh, Thomas F.; Fitch, Kenneth J.; Rivero, Ralph A.; and Dhanoa, Daljit S., 5,183,810, Cl. 514-63.000.

Patino, Joseph; Fernandez, Jose M.; and Bogut, Henry A., to Motorola, Inc. Expanded battery capacity identification scheme and apparatus. 5,184,059, Cl. 320-15.000.

Patriquin, Douglas R.: *See*—
Ellinger, Sylvester M.; Spillman, William B., Jr.; and Patriquin, Douglas R., 5,182,953, Cl. 73-862.335.

Patterson, Jimmy L.; and Riley, Robert E., to BASF Corporation. Blowing agent-containing polymeric MDI compositions. 5,183,582, Cl. 252-182.200.

Patuszynski, Duane R.; O'Callaghan, John S.; and Bartoli, Andrew, to Bell & Howell Document Management Products Company. Multiposition incremental document endorser. 5,182,991, Cl. 101-216.000.

Paul, James M.; and Morris, Richard L., to Mobil Oil Corporation. Method for scale removal in a wellbore. 5,183,112, Cl. 166-312.000.

Pawlak, Andrzej M.: *See*—
Graber, David W.; Eckhardt, Dennis C.; Pawlak, Andrzej M.; and Faist, Bryan L., 5,184,297, Cl. 364-424.050.

Pawlak, Stephen M.; Rimbey, Roger J.; and Rodee, Mark D., to Smith Corona Corporation. Quiet impact printer mechanism. 5,183,344, Cl. 400-160.000.

PCD Polymere Gesellschaft m.b.H.: *See*—
Korsatko-Wabnegg, Brigitta; and Korsatko, Werner, 5,183,666, Cl. 424-464.000.

Pearce, Wayne E.: *See*—
Comstock, Roger D.; Tischner, Ryan K.; and Pearce, Wayne E., 5,183,182, Cl. 222-129.000.

Pearson, Alan L.; and Baker, Richard H., to Steelcase, Inc. Adjustable support for overhead furniture units. 5,183,319, Cl. 312-196.000.

Pearson, Daniel C.: *See*—
Hojnacki, Robert J.; Pearson, Daniel C.; Brucker, Gerard K.; Gober, Michael J.; and Shaw, Daniel J., Jr., 5,183,159, Cl. 206-583.000.

Peck, Leonard E., Jr.: *See*—
Ingle, Lloyd D.; Peck, Leonard E., Jr.; and Santana, Jose A., 5,183,973, Cl. 174-254.000.

Peerless Saw Company, The: *See*—
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Pelachyk, Richard; Satterlee, Lowell W.; Zuccaro, Dante C.; and Farris, Timothy M., to General Motors Corporation. Door handle housing attachment for vehicle door. 5,183,302, Cl. 292-336.300.

Pellerin, James A. Bow pod or holder. 5,183,231, Cl. 248-156.000.

Penaluna, William A.; and Ragsdale, Charles W., to Bio-Rad Laboratories, Inc. Circulating chiller for electrified solutions. 5,183,101, Cl. 165-47.000.

Pengler, Rudolf, to Matheson Gas Products, Inc. Automatic switch-over valve. 5,183,072, Cl. 137-113.000.

Penman, David G.: *See*—
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Pensavecchia, Frank G.: *See*—
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Perez, Thomas F. Apparatus for processing fish food. 5,183,671, Cl. 425-190.000.

Perisho, Randal J.; Heimann, Robert L.; and Soucie, Wayne L., to Orscheln Co. Soft release control mechanism with spring clutch and viscous damping. 5,182,963, Cl. 74-512.000.

Perkins, Wiley D.: *See*—
Scoggins, Lacey E.; Lee, Fu M.; Chang, Allen T.; and Perkins, Wiley D., 5,183,538, Cl. 203-28.000.

Permon, statni podnik pan: *See*—
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Pernick, David, to Monarch Knitting Machinery Corporation. Cam system for circular knitting machine. 5,182,927, Cl. 66-54.000.

Perry, Randal L.: *See*—
Branca, Phillip A.; Hubis, Daniel E.; Mallouk, Robert S.; and Perry, Randal L., 5,183,545, Cl. 204-252.000.

Perry, Winfield B.: *See*—
Cox, Jerry D.; Linz, Raymond E.; Thome, Jeanne M.; Perry, Winfield B.; Hadley, Franklin O., Jr.; and Knobel, Vladimir A., 5,182,881, Cl. 51-7.000.

Persson, Goran, to Swedoor AB. Method for form-pressing wood fibre panels and form pressed panels, for example door skins. 5,183,622, Cl. 264-320.000.

Peter, Julius; and Weckerle, Gunter, to Continental Aktiengesellschaft; and Peter, Julius. Apparatus for producing rubber mixtures. 5,183,640, Cl. 422-135.000.

Peters, William H. Attachment plate for roofing sheets. 5,182,890, Cl. 52-410.000.

Peterson, Steven H.: *See*—
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Petravicius, Stasys: *See*—
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Petrocy, Richard J.: *See*—
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Petroleo Brasileiro S.A.: *See*—
Khalil, Carlos N.; Romeu, Regis K.; and Rabinovitz, Andre , 5,183,581, Cl. 252-8.552.

Petrovich, Paul A. Nonmetallic gun barrel. 5,183,958, Cl. 89-16.000.

Petzinna, Dieter: *See*—
Angerbauer, Rolf; Fey, Peter; Hubsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; and Schmidt, Delf, 5,183,897, Cl. 546-330.000.

Pfahl, Magnus; and Tzukerman, Maty, to La Jolla Cancer Research Foundation. Methods using estrogen receptor as a constitutive transcriptional activator and a repressor. 5,183,736, Cl. 435-6.000.

Pharmachemie B.V.: *See*—
Scheeren, Johan W.; Martinus De Bie, Joannes F.; and De Vos, Dirk, 5,183,913, Cl. 556-446.000.

Pherigo, Douglas E., to J. L. Clark, Inc. Closure with dispensing fitment and screw-on cap. 5,183,171, Cl. 220-256.000.

Philip Morris Incorporated: *See*—
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Philipps, Thomas: *See*—
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Phillips, David J.: *See*—
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Phillips, Emyr: *See—*
O'Neil, Robert M.; Phillips, Emyr; and Wasson, Robert C., 5,183,842, Cl. 524-288.000.
Phillips, Joseph; Prough, J. Robert; Bilodeau, Victor L.; Greenwood, Brian; Bain, Ronald; and Weston, John, to Kamyr, Inc. Atmospheric diffuser improved lower screens backflushing. 5,183,536, Cl. 162-57.000.
Phillips, Michael A.: *See—*
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Nordquest, Kim W., 5,183,868, Cl. 526-155.000.
Scoggins, Lacey E.; Lee, Fu M.; Chang, Allen T.; and Perkins, Wiley D., 5,183,538, Cl. 203-28.000.
Tso, Chung C.; and Wynn, Robert L., 5,183,931, Cl. 560-241.000.
Vives, Van C., 5,183,844, Cl. 524-423.000.
Piana, Hermann: *See—*
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Picanol N.V., naamloze vennootschap: *See—*
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Pichl, Fritz. Circuit arrangement on a support film. 5,184,111, Cl. 340-572.000.
Pickett, Lester C. Method and apparatus for generating mathematical functions. 5,184,317, Cl. 364-735.000.
Pierburg GmbH: *See—*
Hartel, Gunter; Schurfeld, Armin; Losing, Karl-Heinrich; Thonnesen, Dieter; and Remde, Ulrich, 5,182,942, Cl. 73-61.460.
Pierrat, Michel A., to Ency Nova Inc. Magnetic tape drive with integral multiple-cassette removable magazine. 5,184,260, Cl. 360-92.000.
Pike, Steven C.: *See—*
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Pillion, Lawrence M.: *See—*
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Pinza, Mario: *See—*
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Pioneer Electron Corporation: *See—*
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Pioneer Electronic Corporation: *See—*
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Pirelli Trasmissioni Industriali S.p.A.: *See—*
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Pitney Bowes Inc.: *See—*
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Miller, Carl A.; Silverberg, Morton; and Supron, Steven A., 5,183,250, Cl. 271-222.000.
pK Scientific, Inc.: *See—*
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Plastic Forming Company, Inc., The: *See—*
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Platzer, Stephan J. W.; Procter, Arthur E.; and Dunder, Thomas, to Hoechst Celanese Corporation. Colored image on a degradable sheet material and method of formation. 5,183,723, Cl. 430-160.000.
Plemons, R. J., Jr. Adjustable sound attenuating device. 5,183,976, Cl. 181-264.000.
Plotner, Michael: *See—*
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Podell, Allen: *See—*
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Pogue, Bill P.: *See—*
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Polaert, Remy: *See—*
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Policht, Stanislaw A., to Qualex. Photograph album and method for making same. 5,183,296, Cl. 281-46.000.
Poltorak, Jeffrey P.; and Swift, Omar A., to Kontes Glass Company. Stirring assembly. 5,183,336, Cl. 366-273.000.
Poly-Flex Circuits, Inc.: *See—*
Durand, David; Vieau, David P.; Wei, Tai S.; and Chu, Ang-Ling, 5,183,593, Cl. 252-514.000.
Polyplastics Co., Ltd.: *See—*
Kanaka, Keiichi; Hayashi, Noriyuki; Kobashi, Toshihiro; Kageyama, Yukihiko; and Hijikata, Kenji, 5,183,878, Cl. 528-193.000.
Kashihara, Osamu, 5,183,860, Cl. 525-398.000.
Kawaguichi, Kuniaki; Nakane, Toshio; Shimoda, Akihide; and Hijikata, Kenji, 5,183,623, Cl. 264-544.000.
Pompei, Francesco, to Etergen Corporation. Thermometer calibration. 5,183,337, Cl. 374-2.000.
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Popiel, Irene; Holtemann, Karen D.; Glazer, Itamar; and Womersley, Christopher, to Biosys. Commercial storage and shipment of entomogenous nematodes. 5,183,950, Cl. 800-2.000.
Porta, Julien; and Clermont, Christian, to Hospal Industrie. Method and apparatus for drying the ends of a bundle of hollow fibers for a membrane device made up of hollow fibers. 5,182,868, Cl. 34-18.000.
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Potter, Timothy J.; Tamor, Michael A.; and Wu, Ching-Hsong, to Ford Motor Company. Fabrication of polycrystalline free-standing diamond films. 5,183,529, Cl. 156-613.000.
Poulsen, Don K., to Halliburton Company. Method for optimizing hydraulic fracture treatment of subsurface formations. 5,183,109, Cl. 166-250.000.
Powell, Bruce W.; and Powell, Judith F. Handworn mechanism for signalling by scuba divers. 5,183,003, Cl. 116-26.000.
Powell, Harry C., Jr., to Powell Machinery, Inc. Handling of fruit using dual plastic cup construction. 5,183,151, Cl. 198-803.010.
Powell, John D.: *See—*
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Powell, Bruce W.; and Powell, Judith F., 5,183,003, Cl. 116-26.000.
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Powell, Harry C., Jr., 5,183,151, Cl. 198-803.010.
Powell, Robert M. Collapsible scooter. 5,183,129, Cl. 180-208.000.
Powell, Timothy R. Fishing line cutter, and rod and reel therewith. 5,182,874, Cl. 43-25.000.
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Pozgay, Jerome H., to Raytheon Company. All weather tactical strike system (AWTSS) and method of operation. 5,184,137, Cl. 342-174.000.
Pratt, Kenneth W., to Seneca Sports, Inc. Training wheel for in-line skates. 5,183,276, Cl. 280-11.220.
Predohl, Willi, to Reifenhauser GmbH & Co. Maschinenfabrik. Method of making a plastic foil and for winding the plastic foil into a coil or roll. 5,183,606, Cl. 264-40.100.
Presidenza del Consiglio dei Ministri - Ufficio del Ministro per il coordinamento delle Iniziativae per la Ricerca Scientifica e Tecnologica: *See—*
Lepori, Agostino; and Camaioni, Domenico, 5,183,837, Cl. 524-13.000.
Presstek, Inc.: *See—*
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Procedes Petroliers et Petrochimiques: *See—*
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Procter, Arthur E.: *See—*
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Prosser, Albert C., to Coors Technical Ceramics Company. Ball and seat valve. 5,183,068, Cl. 137-1.000.
Protein Technologies International, Inc.: *See—*
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Pyzik, Thomas E., to Omega Engineering, Inc. Paddlewheel flowmeter assembly. 5,182,952, Cl. 73-861.790.
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Quan, Peter M.; and Leeming, Stephen W., to Imperial Chemical Industries PLC. Poly-(n-[2-hydroxybenzyl])-1,2-diaminoethanes. 5,183,940, Cl. 564-370.000.
Quates, Ronald D.: *See—*
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Ragin, John C., III. Detachable brake for skate. 5,183,292, Cl. 280-825.000.
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Ragsdale, Charles W.: *See*—
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Raj, Rishi; and Sievers, Albert J., to Cornell Research Foundation, Inc. Infra red diamond composites. 5,183,602, Cl. 252-587.000.
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Ramaswamy, Rajan: *See*—
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Ramos, Gerado; Ghisalba, Oreste; Schar, Hans-Peter; Frei, Bruno; Maienfisch, Peter; and O'Sullivan, Anthony C., to Sankyo Company, Ltd. Microbial process for the preparation of milbemycin derivatives. 5,183,749, Cl. 435-119.000.
Ramsey, John W., Jr., to Tacticon Corp. Electric powered tip-driven fan with metal/air battery assembly therefor. 5,183,222, Cl. 244-53.00R.
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Ranalletta, Joseph V.; Williams, Fred E., Jr.; and Kanner, Rowland W., to Ryder International Corporation; and pK Scientific, Inc. Liquid dispenser nozzle assembly. 5,183,184, Cl. 222-189.000.
Rand, Cynthia L., to Dow Chemical Company, The. Process for the preparation of diaryl carbonates. 5,183,919, Cl. 558-274.000.
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Rando, Joseph F., to Spectra-Physics Laserplane, Inc. Automatic plumb and level tool with acoustic measuring capability. 5,182,863, Cl. 33-227.000.
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Rapoport, Uri, to Elbit-ATI, Ltd. Apparatus for rotating an NMR test tube. 5,184,078, Cl. 324-321.000.
Rasmussen, David L.; Farrell, Michael E.; and Ortiz, Pedro R., to Xerox Corporation. Method for duplex printing scheduling system combining finisher interset skipped pitches with duplex sheet scheduling. 5,184,185, Cl. 355-308.000.
Rasmussen, John P.: *See*—
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Ratton, Serge, to Rhone-Poulenc Specialities Chimiques. Preparation of hydroquinone monocarboxylates. 5,183,928, Cl. 560-144.000.
Raymond, Marvin L.; Barrett, Dana G.; and Greene, Phillip B., to Golden Cat Corporation. Additive for binding liquid waste. 5,183,010, Cl. 119-172.000.
Raytheon Company: *See*—
Cardiasmenos, Apostle G., 5,184,136, Cl. 342-153.000.
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Readey, Michael J., to Coors Porcelain Company. Aluminum borate ceramics and process for producing same. 5,183,785, Cl. 501-127.000.
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Regnault, Alain; Cretin, Jacques; and Froidevaux, Pascal, to Institut Francais de Petrole; and Compagnie Generale de Geophysique. Method and device for optimizing the triggering of an array of marine seismic sources. 5,184,329, Cl. 367-23.000.
Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
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Reilly Industries, Inc.: *See*—
McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,183,895, Cl. 546-304.000.
Reilly, James W.; and Hamilton, Gary, to ABB Lummus Crest Inc. Production of diesel fuel by hydrogenation of a diesel feed. 5,183,556, Cl. 208-57.000.
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Sheridan, William G.; and Reiskin, Edward D., 5,183,978, Cl. 187-105.000.
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Reiterman, Lee; Martin, Dale D.; and Krysik, Joseph, to GTE Valenite Corporation. Non-contact coolant supply apparatus. 5,183,363, Cl. 408-59.000.
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Remba, David Z.: *See*—
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Remmers, Gregry M., to Outboard Marine Corporation. Test apparatus for opto-electronic time based generator of an ignition system. 5,184,080, Cl. 324-392.000.
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Reynolds Metals Company: *See—*
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Rhodes, Richard D., Jr.; and Fredericks, W. David, to Davidson Textron Inc. Mold method and apparatus for stabilizing the location of a skin insert. 5,183,693, Cl. 428-34.100.
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Ricco, Mario; De Matthaeis, Sisto L.; and Maldera, Domenico, to Elasis Sistema Ricerca Fiat Nel Mezzogiorno Societa Consortile per Azioni. Assembly of an electromagnet core of an electromagnetic internal combustion engine fuel injector. 5,183,209, Cl. 239-585.100.
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Riffle, Judy S.; Sinai-Zingde, Gurudus D.; and Brink, Andrew E., to Virginia Tech Intellectual Properties, Inc. Polyalkyloxazoline/-polylactone copolymers, processes for making, and uses. 5,183,861, Cl. 525-413.000.
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Righetti, Randall D., to Righetti, John Alexander, a part interest. Flexible type fishing lure. 5,182,875, Cl. 43-42.240.
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Rinehart, Steven R.; and Adams, Jonah, Jr., to Philip Morris Incorporated. Apparatus for ultrasonically bonding endcaps to a container of dissimilar material. 5,183,523, Cl. 156-367.000.
Ringle, Larry L.; and Lax, Ronald G., to Ringle, Larry Lee. Dental floss and pre-threaded leader. 5,183,063, Cl. 132-321.000.
Ringle, Larry Lee: *See—*
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Riordan, Kenneth B., to Motorola, Inc. Amplitude control of a burst signal in a receiver. 5,184,349, Cl. 370-95.300.
Rishel, Michael; Powers, Larry; and Barozzini, Claude, to Genlyte Group Incorporated, The. Lighting fixture with lamp holder including integral resilient fins. 5,183,330, Cl. 362-372.000.
Ritter, Gerhard; Ritter, Klaus; and Schmidt, Gerhard, to EVG Entwicklungs-u Verwertungs-Gesellschaft m.b.H. Apparatus for bending steel bars to form concrete reinforcement elements. 5,182,932, Cl. 72-217.000.
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Ritzenthaler, Robert. Mobile mount system. 5,183,162, Cl. 211-1.570.
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Rizzi, Amleto; and Marchioro, Gaetano, to FIS - Fabbrica Italiana Sintetici S.p.A. Process for the optical resolution of threo-2-hydroxy-3-(2'-aminophenylthio)-3-(4''-methoxyphenyl)-propionic acid. 5,183,922, Cl. 560-7.000.
RMS Engineering, Inc.: *See—*
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Robar, Sheldon C.; Fraser, David W.; and Wiley, Bernard A. Engine system using refrigerant fluid. 5,182,913, Cl. 60-671.000.
Robbins, E. Stanley; Robbins, Rodney W.; Watt, Darrel J.; and Wilson, Wendell G., to Robbins Industries, Inc. Adjustable measuring container. 5,182,948, Cl. 73-429.000.
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Roberts, Dane R., to British Columbia Research Corporation. Process for the production, desiccation and germination of conifer somatic embryos. 5,183,757, Cl. 435-240.490.
Roberts, John L., to Milwaukee Valve Company, Inc. Handle locking mechanism for quarter turn valves. 5,183,073, Cl. 137-385.000.
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Robinson, Maureen G. Dispensing liquid animal pick applicator. 5,183,006, Cl. 119-85.000.
Robitschko, Peter: *See—*
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Rohm and Haas Company: *See—*
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Rokutan, Takao, to Olympus Optical Co., Ltd. Optical recording/reproducing apparatus having means for periodically supervising drive current supplied to actuator. 5,184,337, Cl. 369-44.250.
Roland, Taillard: *See—*
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Roman, Horst: *See*—
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Romanet, Robert F.; and Chen, Teh-Hsuan, to Eastman Kodak Company. Photographic silver halide materials and process comprising new pyrazoloazole couplers. 5,183,728, Cl. 430-386.000.

Romano, James J.: *See*—
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Romeu, Regis K.: *See*—
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Ronan, Gerard A.; and Cole, Alistair, to VG Instruments Group Limited. Glow discharge spectrometry. 5,184,016, Cl. 250-288.000.

Roof, Glenn L.; and Kremer, Lawrence N., to Baker Hughes Incorporated. Treatment of oils using choline base. 5,183,560, Cl. 208-236.000.

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Rosenberg, Gideon, to State of Israel, Ministry of Defence Rafael-Armamend Development Authority. Projectile-launching device. 5,183,956, Cl. 89-8.000.

Ross, Gilbert B.; and Brittain, Charles. Oil filter disassembly and recycling apparatus. 5,182,842, Cl. 29-240.000.

Rossoff, Leonard J. Fiberoptic intubating laryngoscope. 5,183,031, Cl. 128-6.000.

Roth, Steven P.: *See*—
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Rothenpieler, Joachim: *See*—
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Rowbotham, Ronald H.; and Cassady, Gregory T., to Roll'n Well Servicing Inc. Derrick assembly capable of conveying pipe sections between a drill string and a rack for said pipe sections. 5,183,122, Cl. 175-52.000.

Roy, Orest Z.; Fulford, Raymond E.; and Legal, Jules O., to Canadian Aging & Rehabilitation Product Development Corporation. Motor-driven chair. 5,183,133, Cl. 180-252.000.

Rubin, Isadore E. Method for recovering solvents through the use of an extender. 5,183,540, Cl. 203-41.000.

Ruedi, Peter: *See*—
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Ruffini, Alberto; and Mammarella, Nicolino, to Pirelli Trasmissioni Industriali S.p.A. Process and apparatus for producing splined driving belts. 5,183,521, Cl. 156-142.000.

Rupnick, Charles J.; Stoddard, Damon R.; and Grindeland, David B., to Sundstrand Corporation. Accelerometer with support caging. 5,182,949, Cl. 73-517.00B.

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Jacobs, Martinus J. N.; and Rutten, Hendrikus J. J., 5,183,701, Cl. 428-229.000.

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Arzouman, Harry H.; and Slay, Clyde E., 5,183,235, Cl. 254-8.00B.

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Sakai, Yozo: *See*—
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Pascal, Roger; and Recher, Gilles, 5,183,618, Cl. 264-257.000.
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Greenlee, Mark L.; Salzmann, Thomas N.; and DiNinno, Frank P., 5,183,887, Cl. 540-364.000.
Samarov, Victor M.; and Arbanas, Zeljko, to Digital Equipment Corporation. Heat dissipation apparatus. 5,184,281, Cl. 361-386.000.
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Cho, Hyun-Deok, 5,184,219, Cl. 358-141.000.
Craft, Jack, 5,184,088, Cl. 330-254.000.
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Yun, Ki-ho, 5,184,084, Cl. 328-15.000.
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Sanders, Raymond W. Multiple purpose certified mail envelope assembly. 5,183,203, Cl. 229-300.000.
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Sanderson, Martin C., to CCL Label, Inc. Coating of substrates. 5,183,696, Cl. 428-194.000.
Sankyo Company, Ltd.: *See*—
Ramos, Gerado; Ghisalba, Oreste; Schar, Hans-Peter; Frei, Bruno; Maienfisch, Peter; and O'Sullivan, Anthony C., 5,183,749, Cl. 435-119.000.
Sankyo Seiki Mfg. Co., Ltd.: *See*—
Kiuchi, Hiroyuki, 5,184,049, Cl. 318-362.000.
Sano, Kazuyoshi; Fujimura, Koh; Suzuki, Takumi; and Tsutsui, Takashi, to Ricoh Company, Ltd. Sealing structure of liquid crystal injection holes in liquid crystal display device. 5,184,239, Cl. 359-80.000.
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Noguchi, Shigeru; Ishida, Satoshi; Iwata, Hiroshi; Sano, Keiichi; and Nakayama, Shoichiro, 5,183,780, Cl. 437-173.000.
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Sanyo Electric Co., Ltd.: *See*—
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Kobayashi, Akio, 5,184,216, Cl. 358-105.000.
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Terakado, Shingo, 5,183,531, Cl. 156-643.000.
Sanz, Antonio M.: *See*—
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Sardella, Louis M. Conveyor system and feeding sheets. 5,183,251, Cl. 271-276.000.
Sarian, Grigor; Crandall, Barry R.; and Duncan, Jeff R., to Baxter International Inc. Temperature control device for fluid filled pad. 5,183,039, Cl. 128-400.000.
Sarraf, Sanwal P.; Weber, Sharon W.; Gilmour, Hugh S. A.; and Ficcaglia, Linda I., to Eastman Kodak Company. Multiple pass laser printing for improved uniformity of a transferred image. 5,183,798, Cl. 503-227.000.
Sartorio, Franco; Prunotto, Gianpaolo; Sgandurra, Francesco; and Arghiracopulos, Salvatore, to Amada Company, Limited. Plate bending machine equipped with a plate clamping manipulator and a plate position detecting device. 5,182,936, Cl. 72-420.000.
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Sase, Akira: *See*—
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Sato, Kazuo: *See*—
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Sato, Takeshi; Tashiro, Minoru; and Miyakawa, Naoomi, to Yamazaki Mazak Corporation. Laser beam machining system and laser beam machine cover. 5,183,993, Cl. 219-121.820.
Sato, Yoshimasa: *See*—
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Sato, Yuichi: *See*—
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Satoh, Isao: *See*—
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Satoh, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Method of making a semiconductor memory device. 5,183,774, Cl. 437-52.000.
Satomi, Mitsuo: *See*—
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Satterlee, Lowell W.: *See*—
Pelachyk, Richard; Satterlee, Lowell W.; Zuccaro, Dante C.; and Farris, Timothy M., 5,183,302, Cl. 292-336.300.
Saur, Roland; Bauer, Friedrich; and Rothenpieler, Joachim, to Behr-Thomson-Dehnstoffregler GmbH & Co. Thermostatic valve. 5,183,012, Cl. 123-41.080.
Sawada, Yosuke; Kakushima, Masatoshi; Nishio, Maki; Miyaki, Takeo; and Oki, Toshikazu, to Bristol-Myers Squibb Company. Method for treating fungal infections with serine analogs of BU-3608 antibiotics. 5,183,808, Cl. 514-33.000.
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Schaeffer, Philippe: *See*—
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Schaffner, Larey D. Power limiter control for a variable displacement axial piston pump. 5,183,393, Cl. 417-218.000.
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Scheeren, Johan W.; Martinus De Bie, Joannes F.; and De Vos, Dirk, to Pharmachemie B.V. Cyclic triketone compounds and trimethylsilyoxy butadiene compounds and their use in the preparation of daunomycinone derivatives. 5,183,913, Cl. 556-446.000.
Scheier, Donald J.; and Hathorn, Jack L., to Johnson Food Equipment, Inc. Method and apparatus for removing the skin from poultry carcasses. 5,183,434, Cl. 452-131.000.
Schein, Lawrence B.: *See*—
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Schellstede, Herman J. Extended reach penetrating tool and method of forming a radial hole in a well casing. 5,183,111, Cl. 166-298.000.
Scher, Herbert I.; Ungar, Israel S.; and Baehr, Richard R., Jr., to Nevamar Corporation. Method and apparatus for continuous casting of polymerizable material. 5,183,600, Cl. 264-26.000.
Scherer, Welby J. Particulate material dispensing device. 5,183,507, Cl. 118-18.000.

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Bressel, Burkhard; Meyer, Heinrich; Meyer, Walter; and Gedrat, Klaus, 5,183,552, Cl. 205-158.000.
Heindl, Josef; Skuballa, Werner; Buchmann, Bernd; Frohlich, Wolfgang; and Ederdt, Rolalnd, 5,183,925, Cl. 560-61.000.
Shaked, Ze'Ev; Stewart, Tracy; Hershenson, Susan; Thomson, James W.; Taforo, Terrance; and Thomson, Jody, 5,183,746, Cl. 435-69.510.
Speck, Ulrich; and Blaszkiewicz, Peter, 5,183,654, Cl. 424-5.000.
Tenbrink, Detlef; Bock, Martin; Heymann, Kurt; and Rimkus, Martin, 5,183,553, Cl. 205-162.000.

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Horan, Ann C., 5,183,758, Cl. 435-252.100.

Scherz, Hal C. Wound dressing retention apparatus. 5,183,460, Cl. 602-79.000.

Schick, Jean-Francois, to Goro S. A. Method of producing devices for interconnecting conveyor or similar belts. 5,182,933, Cl. 72-335.000.

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Schildkraut, Jay S.; Young, Ralph H.; Williams, David J.; and Scozzafava, Michael, to Eastman Kodak Company. Photorefractive device and process for its use. 5,184,323, Cl. 365-124.000.

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Schimpe, Robert, to Siemens Aktiengesellschaft. Optically stabilized feedback amplifier. 5,184,247, Cl. 359-344.000.

Schipper, Paul H.: *See*—
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Schlatter, James C.: *See*—
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Schleicher, Hart E.: *See*—
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Schleigh, William R.; and Welter, Thomas R., to Eastman Kodak Company. 2-substituted-1-hydroxyindoles. 5,183,894, Cl. 546-273.000.

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Schmickl, Werner: *See*—
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Schmidt, Delf: *See*—
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Schmidt, Gerhard: *See*—
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Schmidt, Robert R.: *See*—
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Schneider, Bernard: *See*—
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Scholl, Thomas: *See*—
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Schroder, Waldemar: *See*—
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Schroeder, Wesley A.: *See*—
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Schuler, Andreas: *See*—
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Schulte, Franz: *See*—
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Schultz, Charles P., to Motorola, Inc. Menu selection using adaptive force sensing resistor. 5,184,120, Cl. 340-870.380.

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Claar, Klaus; Deischl, Hans; Lindmayer, Martin; Moczygemba, Jurgen; Schrader, Jergen; Schumacher, Josef; Topfer, Claus; and Robitschko, Peter, 5,184,022, Cl. 307-10.200.

Schurfeld, Armin: *See*—
Hartel, Gunter; Schurfeld, Armin; Losing, Karl-Heinrich; Thonnesen, Dieter; and Remde, Ulrich, 5,182,942, Cl. 73-61.460.

Schurman, Peter T., to Plastic Forming Company, Inc., The. Apparatus for controlling weight and wall thickness of a blow molded article. 5,183,673, Cl. 425-522.000.

Schurr, Michael, to Soehnle-Waagen GmbH & Co. Load-sensing element for a balance. 5,183,125, Cl. 177-211.000.

Schussler, Karl H. Device for gassing liquids. 5,183,595, Cl. 261-64.300.

Schwab, Ekkehard; Veitch, Ronald J.; and Auweter, Helmut, to BASF Aktiengesellschaft. Acicular cobalt-modified iron oxides and their preparation. 5,183,709, Cl. 428-404.000.

Schwartz, Donald: *See*—
Qureshi, Humayun; and Schwartz, Donald, 5,183,765, Cl. 436-180.000.

Schwartz, Nira; and Shahar, Arie. Scanning of moving objects using unique polygon mounted on carousel which rotates at twice polygon's speed. 5,184,246, Cl. 359-216.000.

Schweiker, Werner; and Leininger, Volker, to Behr-Industrieanlagen GmbH & Co. Method for program control for an industrial robot for automatic coating of workpieces. 5,184,051, Cl. 318-568.000.

Schweikert, Eugen: *See*—
Jaehrling, Peter; and Schweikert, Eugen, 5,183,472, Cl. 604-284.000.

Schwemmer, Geary K., to United States of America, National Aeronautics & Space Admininstration. Doppler shift compensation system for laser transmitters and receivers. 5,184,241, Cl. 359-161.000.

SCM Consultants, Inc.: *See*—
Wright, Roger G.; Lindbloom, Leon J.; and Midlam, Lewis C., 5,183,354, Cl. 404-81.000.

Scoggins, Lacey E.; Lee, Fu M.; Chang, Allen T.; and Perkins, Wiley D., to Phillips Petroleum Company. Extraction plus ion exchange processing of a brine stream. 5,183,538, Cl. 203-28.000.

Scozzafava, Michael: *See*—
Schildkraut, Jay S.; Young, Ralph H.; Williams, David J.; and Scozzafava, Michael, 5,184,323, Cl. 365-124.000.

Scripps Research Institute, The: *See*—
Moriarty, Ann M., 5,183,734, Cl. 435-5.000.
Nicolaou, Kyriacos C.; Sorensen, Erik; Hwang, Chan-Kou; Discordia, Robert; Bergman, Robert G.; and Minto, Robert E., 5,183,942, Cl. 568-375.000.

Scriven, Eric F. V.: *See*—
McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,183,895, Cl. 546-304.000.

Scudiere, Matthew B.: *See*—
Hawsey, Robert A.; and Scudiere, Matthew B., 5,184,189, Cl. 356-218.000.

Seaborne, Jonathan, to General Mills, Inc. Amphoteric ceramic microwave heating susceptor compositions with metal salt moderators. 5,183,787, Cl. 501-143.000.

Seager, Stephen W. J. Device for obtaining testicular or penile size and volume measurements. 5,183,055, Cl. 128-774.000.

Sears, Carroll. Fastener hand tool. 5,182,829, Cl. 7-166.000.

Sehlin, Richard C.: *See*—
Schmoeger, Mary L.; Hagmaier, Charles P., Jr.; Bogdanowicz, Mitchell J.; DuMont, Christopher L.; and Sehlin, Richard C., 5,184,175, Cl. 355-32.000.

Seiko Epson Corporation: *See*—
Fukushima, Hiroshi; Motonaga, Akira; Suda, Eriko; Nakajima, Mikito; Takeshita, Katsuyoshi; and Kutsukake, Yusuke, 5,183,870, Cl. 526-273.000.
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.
Kondo, Isao; and Taki, Yosio, 5,182,850, Cl. 29-784.000.
Minowa, Masahiro, 5,183,333, Cl. 400-605.000.
Yamazaki, Katsunori, 5,184,118, Cl. 340-784.000.
Yonekubo, Shuji; Kitahara, Tsuyoshi; Furuta, Tatsuo; Katakura, Takahiro; and Serizawa, Naomi, 5,184,155, Cl. 346-140.00R.

Seiko Instruments, Inc.: *See*—
Takeda, Haruo, 5,182,950, Cl. 73-811.000.

Sekikawa, Norio: *See*—
Yamaguchi, Akira; Uno, Masaru; Sekikawa, Norio; Arai, Fumio; and Matsuzaki, Kenji, 5,183,484, Cl. 55-34.000.

Sekine, Shuji: *See*—
Harada, Naoto; Sekine, Shuji; Furuya, Takeo; and Yoshioka, Nobuo, 5,184,050, Cl. 318-467.000.
Sell, Walter A.: *See*—
Boo, H. Khim; Mittendorf, Donald H.; and Sell, Walter A., 5,183,212, Cl. 241-17.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shumpei, 5,183,685, Cl. 427-571.000.
Yamazaki, Shunpei; Hayashi, Shigenori; Inujima, Takashi; and Hirose, Naoki, 5,183,511, Cl. 118-723.000.
Yamazaki, Shunpei, 5,183,530, Cl. 156-643.000.
Senda, Masayasu: *See*—
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, 5,183,630, Cl. 419-31.000.
Sendai, Tomoko: *See*—
Takeuchi, Hiroshi; Sendai, Tomoko; and Sakai, Yozo, 5,183,988, Cl. 219-69.170.
Seneca Sports, Inc.: *See*—
Pratt, Kenneth W., 5,183,276, Cl. 280-11.220.
Sengoku, Koji: *See*—
Okamoto, Hidefumi; and Sengoku, Koji, 5,183,681, Cl. 426-634.000.
Senju Pharmaceutical Co., Ltd.: *See*—
Morita, Yasushi; Ohtori, Akira; and Andoh, Masako, 5,183,662, Cl. 424-426.000.
Sensors, Inc.: *See*—
Tury, Edward L.; Kaste, Keith; Johnson, Ross E.; and Danielson, David O., 5,184,017, Cl. 250-343.000.
Seo, Kwang-byeog: *See*—
Jin, Dae-je; Seo, Kwang-byeog; and Jeong, Tae-young, 5,183,772, Cl. 437-52.000.
Sequa Corporation: *See*—
Williams, Robert; Sirvet, Enn; and Gabel, Richard A., 5,183,145, Cl. 198-441.000.
Serizawa, Naomi: *See*—
Yonekubo, Shuji; Kitahara, Tsuyoshi; Furuta, Tatsuo; Katakura, Takahiro; and Serizawa, Naomi, 5,184,155, Cl. 346-140.00R.
Service Tool Die & Mfg. Co.: *See*—
Herdzina, Frank J.; and Goodrich, Rollie M., 5,182,934, Cl. 72-405.000.
Servido, John L.; Tucker, Robert E.; and Murphy, James, to Healthdyne, Inc. Pneumatic circuit control for pressure swing adsorption systems. 5,183,483, Cl. 55-26.000.
Setter, Siegfried, to Robert Bosch GmbH. Method and arrangement for checking the controllability of a tank venting valve. 5,182,945, Cl. 73-118.100.
Sevastakis, Gus: *See*—
Xanthakos, Dimitrios; and Sevastakis, Gus, 5,183,465, Cl. 604-108.000.
Severson, Frederick E.; and Quinn, Patrick A. Model railroad reversing motor control system. 5,184,048, Cl. 318-280.000.
Sexton, Kenneth D.: *See*—
McCurry, Patrick W.; Kellogg, James R.; Boekelheide, Karl; Sexton, Kenneth D.; Ellison, George A.; and Hocker, Robert A., 5,184,025, Cl. 307-66.000.
SFS Stadler Holding AG: *See*—
Palm, Erich, 5,183,357, Cl. 411-29.000.
Sgandurra, Francesco: *See*—
Sartorio, Franco; Prunotto, Gianpaolo; Sgandurra, Francesco; and Arghiracopulos, Salvatore, 5,182,936, Cl. 72-420.000.
SGS-Thomson Microelectronics, Inc.: *See*—
Bond, Robert H.; Olla, Michael A.; Morrison, Barry; and Garrison, Linn C., 5,182,851, Cl. 29-827.000.
Shah, Mrugesh K. Automatic seat and shoulder belt apparatus. 5,183,291, Cl. 280-804.000.
Shah, Shailesh C.: *See*—
El-Hefnawi, Sobhy; Shah, Shailesh C.; and Wasyliw, Basil, 5,183,847, Cl. 525-54.440.
Shahar, Arie: *See*—
Schwartz, Nira; and Shahar, Arie, 5,184,246, Cl. 359-216.000.
Shahriary, Iradj; and McNab, Kevin M., to Hughes Aircraft Company. Phase-locked loop frequency tracking device including a direct digital synthesizer. 5,184,092, Cl. 331-16.000.
Shaked, Ze'Ev; Stewart, Tracy; Hershenson, Susan; Thomson, James W.; Taforo, Terrance; and Thomson, Jody, to Schering Aktiengesellschaft. Formulation processes for pharmaceutical compositions of recombinant β-interferon. 5,183,746, Cl. 435-69.510.
Shaklee, Kerry L., to Alliant Techsystems Inc. Method and apparatus for image production by selective or random exposure element activation. 5,184,154, Cl. 346-110.00R.
Shands, Jay A.: *See*—
Hergert, Richard E.; Hergert, Richard R.; Neill, Eugene B.; Pantaleo, Scott B.; Roerig, Arnold J.; Rogers, Thomas D.; Shands, Jay A.; and Takeguchi, Noriaki, 5,183,537, Cl. 162-216.000.
Shanholtz, Carl E.: *See*—
Cardis, Angeline B.; and Shanholtz, Carl E., 5,183,475, Cl. 44-343.000.
Shanley, Thomas M. Fan foldable membership card mailers. 5,183,436, Cl. 462-6.000.
Shape Inc.: *See*—
Lowry, Alan B.; Gelardi, Paul J.; and Rochelo, Donald R., 5,184,255, Cl. 360-60.000.
Sharp, Jeffrey O.: *See*—
Jordan, Scott C.; Wolf, Robert L.; Fleege, Dennis W.; and Sharp, Jeffrey O., 5,184,278, Cl. 361-346.000.
Sharp Kabushiki Kaisha: *See*—
Ayukawa, Akitsu; and Onishi, Shigeo, 5,183,770, Cl. 437-41.000.
Fujii, Yoshihisa; Suzuki, Akira; Furukawa, Katsuki; and Shigeta, Mitsuhiro, 5,184,199, Cl. 257-77.000.
Morooka, Toru; and Okamoto, Yuji, 5,183,240, Cl. 271-3.100.
Nakagawa, Yasuhito, 5,183,800, Cl. 505-1.000.
Nishino, Hiromi; Tarui, Keiji; Toyoshi, Hideyuki; and Morita, Tatsuo, 5,183,725, Cl. 430-313.000.
Ohta, Yoshiji, 5,184,324, Cl. 365-149.000.
Onishi, Shigeo; Yamadai, Tsutomu; and Ishihara, Kazuya, 5,183,782, Cl. 437-192.000.
Sugimoto, Yukihiko, 5,184,150, Cl. 346-76.0PH.
Takenouchi, Norio, 5,184,310, Cl. 364-550.000.
Shau, Gua-Ming: *See*—
Trent, Lane; and Shau, Gua-Ming, 5,183,004, Cl. 119-5.000.
Shaughnessy, Ernie, to Hunter Manufacturing Inc. Latching mechanism for cap tailgate door. 5,183,310, Cl. 296-106.000.
Shaw, Daniel J., Jr.: *See*—
Hojnacki, Robert J.; Pearson, Daniel C.; Brucker, Gerard K.; Gober, Michael J.; and Shaw, Daniel J., Jr., 5,183,159, Cl. 206-583.000.
Shaw, Wilfrid G.: *See*—
Paparizos, Christos; and Shaw, Wilfrid G., 5,183,793, Cl. 502-338.000.
Shaw, William S. Universal commode stopper. 5,182,819, Cl. 4-393.000.
Shell Internationale Research Maatschappij B.V.: *See*—
Briggs, Stuart P., 5,183,907, Cl. 549-310.000.
Shell Oil Company: *See*—
Rodden, John B., 5,183,563, Cl. 210-180.000.
Shell Research Limited: *See*—
Wolfert, Anthony J., 5,183,648, Cl. 423-267.000.
Shellhause, Ronald L., to RMS Engineering, Inc. Hydraulic pressure actuating systems with pivotable mounting. 5,182,911, Cl. 60-533.000.
Sheridan, William G.; and Reiskin, Edward D., to Otis Elevator Company. Elevator governor rope block actuation in low speed emergency situations. 5,183,978, Cl. 187-105.000.
Sheridan, William G.; and Reiskin, Edward D., to Otis Elevator Company. Elevator governor rope restraint when elevator car moves with car doors open. 5,183,979, Cl. 187-108.000.
Sherwood Medical Company: *See*—
Burkholder, Richard A.; and Acker, Gregory G., 5,183,054, Cl. 128-754.000.
Shiba, Noriyuki; and Hayashi, Mamoru, to Tokyo Kikai Seisakusho, Ltd. Ink supply source driving apparatus for rotary presses. 5,182,993, Cl. 101-365.000.
Shibata, Hideki, to Kahishiki Kaisha Toshiba. Semiconductor device having multi-layered wiring, and method of manufacturing the same. 5,184,205, Cl. 257-765.000.
Shibata, Toshiyuki: *See*—
Sakata, Shinji; Miyashita, Takanori; Kondo, Kazuhiko; Sakai, Atsushi; Shibata, Toshiyuki; and Ogawa, Takayuki, 5,183,882, Cl. 514-49.000.
Shibata, Yutaka: *See*—
Tazawa, Shigeru; and Shibata, Yutaka, 5,183,343, Cl. 400-103.000.
Shibukawa, Toshiya: *See*—
Masuhra, Shohei; Tonoki, Satoshi; Shibukawa, Toshiya; and Sugawara, Hirsohi, 5,183,695, Cl. 428-151.000.
Shieh, Han-Ping D.: *See*—
Kryder, Mark H.; and Shieh, Han-Ping D., 5,184,335, Cl. 369-13.000.
Shigematsu, Masayuki: *See*—
Nishimura, Akira; Suzuki, Shuzo; and Shigematsu, Masayuki, 5,184,244, Cl. 359-187.000.
Shigemi, Hirotake: *See*—
Totoki, Toshio; Shigemi, Hirotake; and Yasukawa, Yoshio, 5,183,562, Cl. 210-85.000.
Shigemura, Yutaka: *See*—
Kurando, Shigeo; Makiura, Yoshinori; Shigemura, Yutaka; Ooura, Junichi; Mifune, Eiji; Imafuku, Tatsuo; Komata, Hiroshi; and Ido, Mikio, 5,184,181, Cl. 355-260.000.
Shigeta, Akira: *See*—
Jitai, Yasuhiro; Tanaka, Yukiomi; and Shigeta, Akira, 5,183,601, Cl. 252-524.000.
Shigeta, Mitsuhiro: *See*—
Fujii, Yoshihisa; Suzuki, Akira; Furukawa, Katsuki; and Shigeta, Mitsuhiro, 5,184,199, Cl. 257-77.000.
Shih, Stuart S.: *See*—
Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., 5,183,561, Cl. 208-251.00R.
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, to Fuji Photo Film Co., Ltd. Self-photographing method for cameras. 5,184,166, Cl. 354-400.000.
Shimada, Toshio; Kobayashi, Morio; Tada, Takemi; and Kawaminami, Shigeya, to Hitachi, Ltd. Overload protective device. 5,184,269, Cl. 361-24.000.
Shimanoki, Hisae: *See*—
Miwa, Takao; Ikeda, Takayoshi; Numata, Shunichi; Fujisaki, Koji; and Shimanoki, Hisae, 5,183,838, Cl. 524-109.000.
Shimei, Masato: *See*—
Goto, Shigeki; Shimei, Masato; Miyazawa, Tetsuhiro; Saitou, Yoshitami; and Isono, Nobuyuki, 5,182,970, Cl. 74-866.000.
Shimizu, Susumu: *See*—
Kitajima, Eiji; Oyama, Takashi; Maruden, Eiji; Teraoka, Hirokazu; Yamasaki, Haruki; and Shimizu, Susumu, 5,183,603, Cl. 264-29.200.

Shimizu, Yuji: *See*—
Takahashi, Takehiko; Iwata, Ryuji; and Shimizu, Yuji, 5,183,315, Cl. 297-438.000.

Shimoda, Akihide: *See*—
Kawaguichi, Kuniaki; Nakane, Toshio; Shimoda, Akihide; and Hijikata, Kenji, 5,183,623, Cl. 264-544.000.

Shimoda, Kyouzi; and Yoshimoto, Kyosuke, to Mitsubishi Denki Kabushiki Kaisha. Optical disc system with improved track jumping operation. 5,184,338, Cl. 369-44.250.

Shimoe, Osamu: *See*—
Nakajima, Shin; Aoyama, Hiroyuki; Kagawa, Rihito; and Shimoe, Osamu, 5,184,085, Cl. 328-65.000.

Shimogawa, Natsumi: *See*—
Takeuchi, Yukihisa; Hirota, Toshikazu; Okada, Shigeki; and Shimogawa, Natsumi, 5,184,344, Cl. 369-126.000.

Shimokawa, Yasushi: *See*—
Ohyama, Tsukasa; Shimokawa, Yasushi; Ghoda, Isamu; Takuma, Keisuke; and Koshida, Hitoshi, 5,183,474, Cl. 8-471.000.

Shimomura, Hiroshi: *See*—
Kameyama, Shuichi; Shimomura, Hiroshi; and Kikuchi, Kazuya, 5,183,768, Cl. 437-26.000.

Shimomura, Masako: *See*—
Suga, Yuko; and Shimomura, Masako, 5,184,148, Cl. 346-1.100.

Shin-Etsu Chemical Co., Ltd.: *See*—
Takeda, Yoshihumi; and Hayashida, Akira, 5,183,875, Cl. 528-33.000.

Shin-Etsu Handotai Company, Limited: *See*—
Baba, Masahiko; and Ohtsuna, Hiroshi, 5,183,528, Cl. 156-601.000.

Shin-Etsu Handotai Co., Ltd: *See*—
Ohta, Yutaka; Ohki, Konomu; and Katayama, Masatake, 5,183,783, Cl. 437-225.000.

Shin-Etsu Polymer Co., Ltd.: *See*—
Odashima, Satoshi, 5,183,969, Cl. 174-88.00R.

Shinbo, Haruo: *See*—
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, 5,183,929, Cl. 560-178.000.

Shindo, Atsunori: *See*—
Miyahara, Shoichiro; Shindo, Atsunori; Suzuki, Maki; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,183,754, Cl. 435-226.000.

Shing, Yuen W.: *See*—
Weisz, Paul B.; Shing, Yuen W.; and Folkman, Judah, 5,183,809, Cl. 514-58.000.

Shinjo, Kenji: *See*—
Terada, Masahiro; Togano, Takeshi; Yamashita, Masataka; Iwaki, Takashi; Mori, Shosei; and Shinjo, Kenji, 5,183,586, Cl. 252-299.610.

Shinko Electric Industries Co., Ltd.: *See*—
Wada, Norio; Fukase, Katsuya; and Uchida, Hirofumi, 5,183,711, Cl. 428-596.000.

Shinomoto, Shoji: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shinomoto, Shoji; and Nagai, Masahiko, 5,183,921, Cl. 558-301.000.

Shinozaki, Junichiro: *See*—
Koga, Yoshiro; Gomi, Akihiro; Miyasaka, Takashi; Miyazawa, Yasunaga; Endo, Kenichi; Shinozaki, Junichiro; Yoda, Kaneo; Ichikawa, Takashi; Miyasaka, Hitoshi; and Kaburagi, Chiharu, 5,184,257, Cl. 360-77.050.

Shiokawa, Keiichi: *See*—
Ide, Youji; and Shiokawa, Keiichi, 5,183,697, Cl. 428-195.000.

Shionogi & Company, Ltd.: *See*—
Ohtani, Mitsuaki; and Matsuura, Takaharu, 5,183,909, Cl. 549-463.000.
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shinomoto, Shoji; and Nagai, Masahiko, 5,183,921, Cl. 558-301.000.

Shipp, Philip A.: *See*—
Aubel, John A.; Devall, Jeffrey E.; Gimby, David R.; and Shipp, Philip A., 5,183,087, Cl. 141-59.000.

Shirai, Masataka: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.

Shiraki, Toshinori; Hayano, Fusakazu; and Morita, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Modified block copolymer and a process for producing the same. 5,183,857, Cl. 525-285.000.

Shiratori, Tetsuya; Yamazaki, Fumio; and Taniguchi, Seiichi, to Matsushita Electric Industrial Co., Ltd. Flat picture display device. 5,183,425, Cl. 445-29.000.

Shirdavani, Hossain A. Garment weight transfer apparatus. 5,183,194, Cl. 224-224.000.

Shires, James D. Rocket glider stabilization system. 5,183,960, Cl. 102-348.000.

Shito, Souichi. Device for protecting portion between toes. 5,183,060, Cl. 128-882.000.

Shizuno, Hisamitsu; Kisi, Hirosi; Saito, Hirosi; and Fujii, Makoto, to Taiyo Yuden Kabusikigaisha. Ceramic capacitor and method for fabricating the same. 5,184,277, Cl. 361-321.000.

Shop Vac Corporation: *See*—
Baer, Mark; and Crevling, R. Lent, Jr., 5,184,041, Cl. 310-239.000.

Shore, Kirstina D. Fire safety and hazards game. 5,183,257, Cl. 273-243.000.

Showa Aluminum Kabushiki Kaisha: *See*—
Tokutake, Toshinori, 5,183,103, Cl. 165-167.000.

Showa Denko K.K.: *See*—
Maruyama, Satoshi; Minorikawa, Naoki; Arakawa, Tsutomu; Yoshida, Haruo; Tagoshi, Hirotaka; and Abe, Kazuto, 5,183,917, Cl. 558-251.000.

Showa Shell Sekiyu Kabushiki Kaisha: *See*—
Suzuki, Yoshiichi, 5,183,934, Cl. 562-423.000.

Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, to Centre International de Recherches Dermatologiques (CIRD). Benzonaphtahalene derivatives, a process for their preparation and their use in therapeutic and cosmetic compositions. 5,183,889, Cl. 544-174.000.

Shyu, Steven: *See*—
Fung, Jimmy; An, Jiu; Campbell, David L.; and Shyu, Steven, 5,184,129, Cl. 341-144.000.

Sidky, Paulette S.; and Hocking, Michael G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Contactless heating frequency heating of thin filaments. 5,183,985, Cl. 219-10.61R.

Siemens Aktiengesellschaft: *See*—
Brune, Richard; Papiernik, Wolfgang; and Rochholz, Guenter, 5,184,056, Cl. 318-799.000.
Dalen, Bjoern; Nilsson, Kenth-Ake-Sune; Hoegnelid, Kurt; and Wecke, Liliane, 5,183,056, Cl. 128-782.000.
Hoffmann, Kurt; Kraus, Rainer; and Kowarik, Oskar, 5,184,326, Cl. 365-201.000.
Jaehrling, Peter; and Schweikert, Eugen, 5,183,472, Cl. 604-284.000.
Kraft, Longin, 5,184,039, Cl. 310-89.000.
Muller, Erwin, 5,184,102, Cl. 335-202.000.
Schimpe, Robert, 5,184,247, Cl. 359-344.000.

Siemens Automotive Limited: *See*—
Cook, John E., 5,183,022, Cl. 123-520.000.
Hanson, John D., 5,183,023, Cl. 123-520.000.

Siemens Energy & Automation, Inc.: *See*—
Craggs, Jack L.; and Burke, Robert R., 5,183,975, Cl. 181-202.000.
DiMarco, Bernard; Black, Robert E.; and Cella, Stephen D., 5,184,099, Cl. 335-16.000.

Sievers, Albert J.: *See*—
Raj, Rishi; and Sievers, Albert J., 5,183,602, Cl. 252-587.000.

Sikes, Roger A.: *See*—
DiNapoli, Antonio; Goff, Gerald L.; and Sikes, Roger A., 5,183,245, Cl. 269-254.00R.

Silk Engineering (Derby) Limited: *See*—
Silk, George, 5,183,365, Cl. 408-80.000.

Silk, George, to Silk Engineering (Derby) Limited. Boring and surfacing machine. 5,183,365, Cl. 408-80.000.

Sill, Gerald A.: *See*—
Fenton, Gary L.; Sill, Gerald A.; Ingram, Robert S.; and Jimenez, James G., 5,183,375, Cl. 410-35.000.

Siltech Inc.: *See*—
Parkinson, Jeff; and O'Lenick, Anthony J., Jr., 5,183,845, Cl. 524-726.000.

Silverberg, Morton: *See*—
Miller, Carl A.; Silverberg, Morton; and Supron, Steven A., 5,183,250, Cl. 271-222.000.

Simmonds Precision Products, Inc.: *See*—
Ellinger, Sylvester M.; Spillman, William B., Jr.; and Patriquin, Douglas R., 5,182,953, Cl. 73-862.335.

Simon, Georg, to Wagner International AG. Electrostatic paint spray gun. 5,184,276, Cl. 361-228.000.

Simon, Pal, to U.S. Philips Corp. Shaving apparatus. 5,182,857, Cl. 30-34.050.

Simoncsits, Andras; Kalman, Miklos; Kari, Csaba; and Cserpan, Imre, to Vepex Contractor Ltd.; and Mta Szegedi Biologiai Kozpontja. Process for the preparation of oligo- and polydeoxyribonucleotides. 5,183,748, Cl. 455-91.000.

Simpson, W. Dwain; and Pyle, James H., to Saber Equipment Corp. Fluid dispensing nozzle including in line flow meter and data processing unit. 5,184,309, Cl. 364-510.000.

Sinai-Zingde, Gurudus D.: *See*—
Riffle, Judy S.; Sinai-Zingde, Gurudus D.; and Brink, Andrew E., 5,183,861, Cl. 525-413.000.

Sinclair, Robert B.: *See*—
Rai, Kula R.; Lew, Thomas M.; and Sinclair, Robert B., 5,184,190, Cl. 356-239.000.

Sirvet, Enn: *See*—
Williams, Robert; Sirvet, Enn; and Gabel, Richard A., 5,183,145, Cl. 198-441.000.

SiScan Systems, Inc.: *See*—
Smith, Ian R., 5,184,021, Cl. 250-560.000.

Siteg Siebtechnik GmbH: *See*—
Lefferts, Johannes, 5,183,442, Cl. 474-239.000.

Sitzmann, Michael E., to United States of America, Navy. N,N'-bis(4,4,4-trinitrobutyryl)hydrazine. 5,183,938, Cl. 564-151.000.

Siwek, C. Kenneth; Flower, Wallace C.; and Garn, Gene D., to Lord Corporation. Dual-rate surface effect dampers. 5,183,137, Cl. 188-381.000.

Skaleski, Robert A. Improved finger tip mounted holding device. 5,182,972, Cl. 81-44.000.

Skuballa, Werner: *See*—
Heindl, Josef; Skuballa, Werner; Buchmann, Bernd; Frohlich, Wolfgang; and Ederdt, Rolalnd, 5,183,925, Cl. 560-61.000.

Slaiken, Stephen J. Interlocking-continuous base bookends. 5,183,163, Cl. 211-43.000.

Slay, Clyde E.: *See—*
Arzouman, Harry H.; and Slay, Clyde E., 5,183,235, Cl. 254-8.00B.
Sleger, Roger R.: *See—*
Foote, Wayne E.; Mui, Paul K.; and Sleger, Roger R., 5,184,265, Cl. 360-106.000.
Slemp, Mark C. Golf ball holder dispenser. 5,183,154, Cl. 206-315.900.
Slinn, David S. L., to ISC Chemicals Limited. Cleaning and drying of electronic assemblies. 5,183,067, Cl. 134-61.000.
Slocum, Donald. Raised insulated and water resistant composite flooring material. 5,182,891, Cl. 52-480.000.
Smalley, Dennis R.: *See—*
Hull, Charles W.; Spence, Stuart T.; Albert, David J.; Smalley, Dennis R.; Harlow, Richard A.; Stinebaugh, Phil; Tarnoff, Harry L.; Nguyen, Hop D.; Lewis, Charles W.; Vorgitch, Tom J.; and Remba, David Z., 5,184,307, Cl. 364-474.240.
Smiley, Dean H.: *See—*
Duncan, James E.; and Smiley, Dean H., 5,183,620, Cl. 264-290.700.
Smith Corona Corporation: *See—*
Pawlak, Stephen M.; Rimbey, Roger J.; and Rodee, Mark D., 5,183,344, Cl. 400-160.000.
Smith, Douglas C.: *See—*
Black, Edward P.; and Smith, Douglas C., 5,184,115, Cl. 340-708.000.
Smith, Ian R., to SiScan Systems, Inc. Method and apparatus for measuring the dimensions of patterned features on a lithographic photomask. 5,184,021, Cl. 250-560.000.
Smith, James F.; and Schroeder, Wesley A., to GMI Holdings, Inc. Manually adjustable housing portions for actuating an electrical appliance switch. 5,183,982, Cl. 200-61.850.
Smith, Larry P.: *See—*
Vasconcellos, Stephen R.; Boyce, P. Douglas; and Smith, Larry P., 5,183,575, Cl. 210-724.000.
Smith and Nephew Associated Companies p.l.c.: *See—*
Ansell, Christopher W. G., 5,183,664, Cl. 424-445.000.
Smith, Richard E.: *See—*
Zak, James L.; and Smith, Richard E., 5,183,152, Cl. 206-524.400.
Smith, Robert J.: *See—*
Leaney, Peter A.; and Smith, Robert J., 5,183,113, Cl. 166-316.000.
Smith, Stephen D.: *See—*
Liboff, Abraham R.; McLeod, Bruce R.; and Smith, Stephen D., 5,183,456, Cl. 600-9.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Guse, Rudolf; Nobis, Dieter; and Malinowski, Hans, 5,182,847, Cl. 29-527.700.
Smuckler, Jack H. Rapid curing, electrically conductive adhesive. 5,183,599, Cl. 264-22.000.
Smyly, George M., Sr. Trailered cradle and boat/yacht managing method. 5,183,282, Cl. 280-414.100.
Snow, Dane R., to Harris Corporation. Integrating A/D converter with means for reducing rollover error. 5,184,128, Cl. 341-128.000.
Snowboardlinik und Handelsges m.b.H.: *See—*
Heinzle, Egon, 5,183,164, Cl. 211-70.500.
Snyder, Thomas S.; Gass, William R.; Worcester, Samuel A.; Ayers, Laura J.; and Boris, Gregory F., to Westinghouse Electric Corp. Decontamination of radioactive metals. 5,183,541, Cl. 204-105.00R.
Snyder, Thomas S.; Jackovitz, John F.; and Ferrari, Harry M., to Westinghouse Electric Corp. System and method for continuous separation of isotopes. 5,183,548, Cl. 204-299.00R.
Societe Chimique des Charbonnages: *See—*
Erpelding, Michel; and Vandome, Jacques, 5,183,840, Cl. 524-228.000.
Societe de Fabrication d'Instruments de Mesure (S.F.I.M.): *See—*
Delattre, Jacques; Gouze, Philippe; and Neuvessel, Jacques, 5,184,054, Cl. 318-586.000.
Societe Francaise de Detecteurs Infrarouges (SOFRADIR): *See—*
Montanari, Jean-Louis, 5,182,852, Cl. 29-840.000.
Societe Industrielle d'Equipment Mecanique: *See—*
Dennys, Jean-Pierre, 5,183,273, Cl. 277-170.000.
Soehnle-Waagen GmbH & Co.: *See—*
Schurr, Michael, 5,183,125, Cl. 177-211.000.
Soffer, Abraham: *See—*
Oren, Yoram; Cohen, Haim; and Soffer, Abraham, 5,183,546, Cl. 204-290.00R.
Software Toolworks, The: *See—*
Monte, Charles; Worthington, Norman A., III; Mandel, Jonathan; and Davenport, Gary F., 5,183,398, Cl. 434-227.000.
Sohda, Takashi; and Ikeda, Hitoshi, to Takeda Chemical Industries, Ltd. Pyridine N-oxide compounds which are useful as hypoglycemic and hypolipidemic agents. 5,183,823, Cl. 514-358.000.
Solar Reactor Technologies, Inc.: *See—*
Parker, Robin Z.; and Langhoff, Peter W., 5,182,912, Cl. 60-641.800.
Solid State Devices, Inc.: *See—*
Bartur, Meir, 5,184,198, Cl. 257-471.000.
Sollac: *See—*
Thierry, Mauricka; Pascal, Verrier; and Roland, Taillard, 5,183,633, Cl. 420-92.000.
Sony Corporation: *See—*
Ikeda, Jiro, 5,183,547, Cl. 204-298.250.
Kobayashi, Toshiharu; and Unno, Keisuke, 5,184,228, Cl. 358-310.000.
Mitsui, Hidero; Kamaya, Naoki; Itoh, Hiroaki; and Sasaki, Yuu, 5,183,714, Cl. 429-123.000.
Noguchi, Hideaki, 5,184,261, Cl. 360-94.000.
Watanabe, Hisanori; and Ito, Shinji, 5,184,262, Cl. 360-96.200.
Sorensen, Brad. Carpet stretching apparatus particularly for long lengths of carpet. 5,183,238, Cl. 254-209.000.
Sorensen, Erik: *See—*
Nicolaou, Kyriacos C.; Sorensen, Erik; Hwang, Chan-Kou; Discordia, Robert; Bergman, Robert G.; and Minto, Robert E., 5,183,942, Cl. 568-375.000.
Sorko-Ram, Paul. Convex reflective sign and method of making same. 5,183,688, Cl. 427-164.000.
Sorrell, Harold E. Combination shut-off and test-injection valve. 5,183,078, Cl. 137-883.000.
Soucie, Wayne L.: *See—*
Perisho, Randal J.; Heimann, Robert L.; and Soucie, Wayne L., 5,182,963, Cl. 74-512.000.
Southern California Edison: *See—*
Ortolano, Ralph J.; Ball, Kenneth A.; and Bowman, Gary, 5,183,244, Cl. 269-43.000.
Southwest Research Institute: *See—*
Mallow, William A.; and Dziuk, Jerome J., Jr., 5,183,763, Cl. 436-106.000.
Sowers, Edward E.: *See—*
McQuigg, Donald W.; Sowers, Edward E.; Goe, Gerald L.; Scriven, Eric F. V.; and Keay, James G., 5,183,895, Cl. 546-304.000.
Sowinski, Allan F.: *See—*
Schmittou, Eric R.; and Sowinski, Allan F., 5,183,727, Cl. 430-372.000.
Spadafora, Peter J.: *See—*
Hogan, Martin A.; Leppek, Kevin G.; and Spadafora, Peter J., 5,184,299, Cl. 364-426.020.
Spademan, Richard G. Walker brace. 5,183,036, Cl. 602-10.000.
Spath, Helmut: *See—*
Wanninger, Paul; Wild, Richard; Kleinschmidt, Ernst; and Spath, Helmut, 5,183,520, Cl. 149-19.910.
Speck, Ulrich; and Blaszkiewicz, Peter, to Schering Aktiengesellschaft. Nonionic x-ray contrast medium with high iodine content. 5,183,654, Cl. 424-5.000.
Spectra Physics: *See—*
Middleton, Christopher O.; and Robson, Colin L., 5,184,293, Cl. 364-167.010.
Spectra-Physics, Inc.: *See—*
Gatten, Ronald A.; Miller, Leslie A.; McCall, Thomas J., Jr.; and Nau, Vance J., 5,183,486, Cl. 55-159.000.
Spectra-Physics Laserplane, Inc.: *See—*
Rando, Joseph F., 5,182,863, Cl. 33-227.000.
Spectrum Innovations, Inc.: *See—*
Drago, Ronald P., 5,183,237, Cl. 254-134.400.
Spence, Stuart T.: *See—*
Hull, Charles W.; Spence, Stuart T.; Albert, David J.; Smalley, Dennis R.; Harlow, Richard A.; Stinebaugh, Phil; Tarnoff, Harry L.; Nguyen, Hop D.; Lewis, Charles W.; Vorgitch, Tom J.; and Remba, David Z., 5,184,307, Cl. 364-474.240.
Spencer, Douglas A.: *See—*
Farwell, Charles Y.; Hearn, Michel L.; Heidebrecht, Richard M.; Ho, Kelvin K.; and Spencer, Douglas A., 5,184,347, Cl. 370-94.100.
Spencer Wright Industries, Inc.: *See—*
Bardsley, Harold B., 5,182,997, Cl. 112-80.730.
Speranza, George P.: *See—*
Cuscurida, Michael; and Speranza, George P., 5,183,923, Cl. 560-26.000.
Marquis, Edward T.; Speranza, George P.; and Su, Wei-Yang, 5,183,514, Cl. 134-38.000.
Spillman, William B., Jr.: *See—*
Ellinger, Sylvester M.; Spillman, William B., Jr.; and Patriquin, Douglas R., 5,182,953, Cl. 73-862.335.
Spinney, Stewart C., to Concrete Technology, Inc. Cellular concrete. 5,183,505, Cl. 106-672.000.
Spraying Systems Co.: *See—*
Haruch, James, 5,183,322, Cl. 239-394.000.
Sprung, Hartwig: *See—*
Becker, Eberhard; Schulte, Franz; Sprung, Hartwig; Staggl, Ronald; and Stoeber, Manfred, 5,183,377, Cl. 414-751.000.
SPX Corporation: *See—*
Manz, Kenneth W.; and Powers, Christopher M., 5,182,918, Cl. 62-149.000.
Square D Company: *See—*
Jordan, Scott C.; Wolf, Robert L.; Fleege, Dennis W.; and Sharp, Jeffrey O., 5,184,278, Cl. 361-346.000.
Srivastava, Gopal K., to Zenith Electronics Corporation. Circuit for phase locking an oscillator within any one of a plurality of frequency ranges. 5,184,091, Cl. 331-10.000.
Srol, Karl. Reusable safety cap for booster cable. 5,183,407, Cl. 439-135.000.
SSI Medical Services, Inc.: *See—*
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,182,826, Cl. 5-453.000.
Staff Co., Ltd.: *See—*
Todokoro, Masatoshi, 5,183,431, Cl. 446-142.000.
Staggl, Ronald: *See—*
Becker, Eberhard; Schulte, Franz; Sprung, Hartwig; Staggl, Ronald; and Stoeber, Manfred, 5,183,377, Cl. 414-751.000.
Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Spinning or twisting spindle arrangement. 5,182,901, Cl. 57-135.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans, a part interest. Open-end spinning machine. 5,182,903, Cl. 57-301.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 5,182,901, Cl. 57-135.000.
Stahlecker, Fritz, 5,182,903, Cl. 57-301.000.

Stalberg, Nils G.: *See—*
Hakenewerth, Paul A.; Rohrer, Gene D.; and Stalberg, Nils G., 5,183,999, Cl. 235-379.000.

Stanbury, Evan J.; and Thomas, Lloyd S., to Alcatel Australia Limited. Unauthorized utility use monitor apparatus and method. 5,184,119, Cl. 340-825.600.

Stancliffe, A. Colin; Vidano, Paul; and Pogue, Bill P., to Allied-Signal Inc. Heat exchange. 5,183,106, Cl. 165-166.000.

Standard Oil Company, The: *See—*
Paparizos, Christos; and Shaw, Wilfrid G., 5,183,793, Cl. 502-338.000.

Standard Products Company, The: *See—*
Zoller, Robert A., 5,183,303, Cl. 293-120.000.

Standex International GmbH: *See—*
Werthmann, Wilfried, 5,183,551, Cl. 205-70.000.

Stanislowski, Anna G.; England, J. Bruce; and Ratcliff, Steven D., to Clorox Company, The. Combined odor controlling animal litter. 5,183,655, Cl. 424-76.600.

Stanley Electric Co., Ltd.: *See—*
Ozawa, Kenichi; and Suekane, Shinichi, 5,184,290, Cl. 363-21.000.

Starchem GmbH: *See—*
Heidel, Klaus; and Scholz-Weigl, Sigrid, 5,183,872, Cl. 527-300.000.

Stasell, Mark W., to Navistar International Transportation Corp. Automotive vehicle microprocessor control having clutch priority engine speed control. 5,184,301, Cl. 364-431.070.

State of Israel, Israel Atomic Energy Commission: *See—*
Oren, Yoram; Cohen, Haim; and Soffer, Abraham, 5,183,546, Cl. 204-290.00R.

State of Israel, Ministry of Defence Rafael-Armamend Development Authority: *See—*
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Stauffer, Harold F., Jr.: *See—*
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; and Stauffer, Harold F., Jr., 5,183,902, Cl. 548-950.000.

Stavely, Donald J.: *See—*
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Steelcase, Inc.: *See—*
Pearson, Alan L.; and Baker, Richard H., 5,183,319, Cl. 312-196.000.

Stege, Jurgen, to Audi A.G. Fuel tank for motor vehicles. 5,183,170, Cl. 220-86.200.

Stein, Gunter. Check valve. 5,183,075, Cl. 137-493.600.

Steinberg, Timothy D.; and Gunderson, Richard W., to Wagner Spray Tech Corporation. Air seal for paint guns. 5,183,207, Cl. 239-526.000.

Steiner, Walter: *See—*
Wizani, Wolfgang; Esterbauer, Hermann; Steiner, Walter; and Gomes, Joseph, 5,183,753, Cl. 435-201.000.

Steinway Musical Properties, Inc.: *See—*
Calabrese, Salvadore J.; Scarton, Henry A.; Murray, S. Frank; Ettles, Christopher M.; Kennedy, Warren C.; Dinc, Saim; Jlidi, Bessem; and Strong, William, 5,183,955, Cl. 84-437.000.

Stellwagen, Armin, to Mannesmann Rexroth GmbH. Valve system for load-independent hydraulic control of a plurality of hydraulic consumers. 5,182,909, Cl. 60-426.000.

Stelmach, John J. Martial arts training apparatus. 5,183,450, Cl. 482-83.000.

Stelter, Eric C.; and Guth, Joseph E., to Eastman Kodak Company. Toner charge control. 5,183,964, Cl. 118-653.000.

Stenner, John R. Filament, cordage locking device. 5,182,838, Cl. 24-712.700.

Stephens, David M. Bicycle frame element protector. 5,183,281, Cl. 280-279.000.

Stephens, Frederick J.: *See—*
Hassell, Morgan V.; Stephens, Frederick J.; and Edwards, Ernest J., 5,183,691, Cl. 427-286.000.

Stephens, William F. N.; and Lummes, Stephen E., to Renishaw plc. Opto-electronic scale reading apparatus. 5,184,014, Cl. 250-237.00G.

Stephenson, Roger C.; and Hyatt, Hugh M., to G & H Technology, Inc. Electrical overstress pulse protection. 5,183,698, Cl. 428-209.000.

Sterhan, Marcia: *See—*
Lopez, Luis R.; and Sterhan, Marcia, 5,183,735, Cl. 435-6.000.

Sterling Winthrop Inc.: *See—*
Mattes, Kenneth C.; and Venepalli, Bhaskar R., 5,183,813, Cl. 514-150.000.

Stevens, Jeremy R.: *See—*
Kinghorn, John R.; and Stevens, Jeremy R., 5,184,220, Cl. 358-147.000.

Stevenson, Gregory S. Sleeve valve system for internal combustion engine having elliptical path. 5,183,014, Cl. 123-59.0AC.

Stewart, Andrew O.: *See—*
Brooks, Dee W.; Stewart, Andrew O.; and Martin, Jonathan G., 5,183,818, Cl. 514-231.500.

Stewart & Stevenson Services, Inc.: *See—*
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Stewart, Tracy: *See—*
Shaked, Ze'Ev; Stewart, Tracy; Hershenson, Susan; Thomson, James W.; Taforo, Terrance; and Thomson, Jody, 5,183,746, Cl. 435-69.510.

Stibrany, Robert T.; and Gorun, Sergiu M., to Exxon Research and Engineering Company. Catalytic production of aryl alkyl hydroperoxides by manganese complexes. 5,183,945, Cl. 568-574.000.

Stichter, Ralph L.: *See—*
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Stine, Ernest F., Jr.: *See—*
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Stinebaugh, Phil: *See—*
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Stinson, D. Ray; Stinson, Linda D.; Roberts, Brian F.; Dahms, Steven J.; Estes, Brian P.; and Robertson, Tommy H., to Stinson, D. Ray; and Stinson, Linda D. Waterbed. 5,182,825, Cl. 5-451.000.

Stinson, Linda D.: *See—*
Stinson, D. Ray; Stinson, Linda D.; Roberts, Brian F.; Dahms, Steven J.; Estes, Brian P.; and Robertson, Tommy H., 5,182,825, Cl. 5-451.000.

Stirling Technology, Inc.: *See—*
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Stoddard, Damon R.: *See—*
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Stoeber, Manfred: *See—*
Becker, Eberhard; Schulte, Franz; Sprung, Hartwig; Staggl, Ronald; and Stoeber, Manfred, 5,183,377, Cl. 414-751.000.

Stolpmann, James R.: *See—*
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,182,826, Cl. 5-453.000.

Stoughton Trailers, Inc.: *See—*
Fenton, Gary L.; Sill, Gerald A.; Ingram, Robert S.; and Jimenez, James G., 5,183,375, Cl. 410-35.000.

Stransky, Larry W.; Boehm, Valentine R., Jr.; and Phillips, Michael A., to General Electric Company. Method for automatic bypass operation. 5,182,905, Cl. 60-204.000.

Stranzinger, Margarete. Float. 5,183,001, Cl. 114-266.000.

Straub, Timo: *See—*
Allmendinger, Franz; Ebner, Arno; Ettischer, Helmut; and Straub, Timo, 5,183,195, Cl. 227-29.000.

Strickland, Edward. Fire extinguisher. 5,183,117, Cl. 169-46.000.

Stritzke, Gunter: *See—*
Besendorfer, Herman; Stritzke, Gunter; and Haditsch, Franz, 5,184,070, Cl. 324-225.000.

Strong, William: *See—*
Calabrese, Salvadore J.; Scarton, Henry A.; Murray, S. Frank; Ettles, Christopher M.; Kennedy, Warren C.; Dinc, Saim; Jlidi, Bessem; and Strong, William, 5,183,955, Cl. 84-437.000.

Stuart, Lambert M., to Concordia Mfg. Co., Inc. Apparatus and method for commingling continuous multifilament yarns. 5,182,839, Cl. 28-283.000.

Styfhoorn, John, to Caterpillar Inc. Oil filter crusher. 5,182,988, Cl. 100-98.00R.

Su, Wei-Yang: *See—*
Marquis, Edward T.; Speranza, George P.; and Su, Wei-Yang, 5,183,514, Cl. 134-38.000.

Suchy, Milos; Winternitz, Paul; and Zeller, Martin, to Ciba-Geigy Corporation. Herbicidal 3-aryluracils. 5,183,492, Cl. 504-243.000.

Suda, Eriko: *See—*
Fukushima, Hiroshi; Motonaga, Akira; Suda, Eriko; Nakajima, Mikito; Takeshita, Katsuyoshi; and Kutsukake, Yusuke, 5,183,870, Cl. 526-273.000.

Suda, Koichi; Matsuzaki, Hitoshi; Wada, Masayuki; and Ozeki, Shoichi, to Hitachi, Ltd.; and Hitachi Haramachi Semi-Conductor Ltd. High-side switch with overcurrent protecting circuit. 5,184,272, Cl. 361-87.000.

Suekane, Shinichi: *See—*
Ozawa, Kenichi; and Suekane, Shinichi, 5,184,290, Cl. 363-21.000.

Suga, Toshiyuki; Kitajima, Shinichi; and Kobayashi, Yoshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Air-fuel ratio control system for internal combustion engines. 5,183,021, Cl. 123-478.000.

Suga, Yuko; and Shimomura, Masako, to Canon Kabushiki Kaisha. Ink jet recording having an ink with carbon black. 5,184,148, Cl. 346-1.100.

Sugai, Maureen, to Motorola, Inc. Singulating assembly for presenting work pieces. 5,183,181, Cl. 221-155.000.

Sugasawa, Masayuki: *See—*
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Sugawara, Hirsohi: *See—*
Masuhra, Shohei; Tonoki, Satoshi; Shibukawa, Toshiya; and Sugawara, Hirsohi, 5,183,695, Cl. 428-151.000.

Sugaya, Yasuhiro: *See—*
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Sugibayashi, Tadahiko, to NEC Corporation. Bootstrap circuit incorporated in semiconductor memory device for driving word lines. 5,184,035, Cl. 307-482.000.

Sugimoto, Takeshi: *See—*
Matsuoka, Fumio; Negoro, Kouichi; Sugimoto, Takeshi; Yamaguchi, Toshiaki; and Yamashita, Tetsuya, 5,182,920, Cl. 62-206.000.

Sugimoto, Yukihiko, to Sharp Kabushiki Kaisha. Thermal printer for providing printed characters with a uniform density. 5,184,150, Cl. 346-76.0PH.

Sugiura, Sadao: *See—*
Koga, Yoshitaka; and Sugiura, Sadao, 5,183,308, Cl. 296-75.000.

Sugiyama, Akira: *See*—
Kose, Junichi; Sugiyama, Akira; Yamada, Minoru; and Nozaki, Ryoei, 5,184,164, Cl. 354-298.000.
Sugiyama, Hiroyuki; Miyamoto, Toshio; and Maejima, Kazuhiro, to Komori Corporation. Plate lockup apparatus for sheet-fed press. 5,182,994, Cl. 101-415.100.
Sugiyama, Kenji, to Victor Company of Japan, Ltd. System for very efficiently coding by performing interblock and intrablock normalization. 5,184,316, Cl. 364-715.020.
Suhara, Hidenori, to Yamaha Hatsudoki Kabushiki Kaisha. Idling control device for high pressure fuel injection engine. 5,183,019, Cl. 123-339.000.
Suita, Yoshihiro; and Ito, Tosikazu, to Tokai Kogyo Kabushiki Kaisha. Process and apparatus for manufacturing frame with groove for use with panel. 5,183,612, Cl. 264-145.000.
Sukegawa, Osamu, to NEC Corporation. Active matrix liquid crystal display panel with an electrostatic protection circuit. 5,184,235, Cl. 359-60.000.
Sullivan, James F., Jr., to Triple/S Dynamics, Inc. Apparatus and methods for conveying materials. 5,183,143, Cl. 198-370.000.
Sullivan, Michael J.; and Dussault, Douglas G., to United States of America, Navy. Transducer circuit for removing reactive component of transducer signal. 5,184,331, Cl. 367-135.000.
Sullivan, Michael R. Means for producing high precision castings. 5,183,095, Cl. 164-34.000.
Sullivan, Thomas J.: *See*—
Gilchrist, Alan R.; Sullivan, Thomas J.; and Walker, Roger C., 5,182,906, Cl. 60-226.100.
Sumimoto Electric Interconnect Products, Inc.: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, 5,183,501, Cl. 106-22.00D.
Nakamatsu, Toshio; Terao, Masanobu; Muneishi, Shigetoshi; Kometani, Norio; and Hayashi, Yoshiaki, 5,183,892, Cl. 546-76.000.
Sumitomo Electric Industries, Ltd.: *See*—
Nishimura, Akira; Suzuki, Shuzo; and Shigematsu, Masayuki, 5,184,244, Cl. 359-187.000.
Sumitomo Gomu Kogyo Kabushiki Kaisha: *See*—
Miyamoto, Yoshiaki; Sasaki, Teruo; Fujisawa, Kazuhiro; and Kato, Seinosuke, 5,182,888, Cl. 52-167.0DF.
Sumitomo Pharmaceuticals Company, Limited: *See*—
Ikeda, Yoshiharu; Kai, Yoshiyuki; and Ono, Keiichi, 5,183,660, Cl. 424-94.300.
Sumitomo Seika Chemicals Co., Ltd.: *See*—
Yamaguchi, Akira; Uno, Masaru; Sekikawa, Norio; Arai, Fumio; and Matsuzaki, Kenji, 5,183,484, Cl. 55-34.000.
Sumitomo Special Metals Co., Ltd.: *See*—
Sagawa, Masato; Fujimura, Setsuo; and Matsuura, Yutaka, 5,183,516, Cl. 148-302.000.
Sun, Han-Ching. Rake connection assembly. 5,182,899, Cl. 56-400.170.
Sunds Defibrator Rauma Oy: *See*—
Tikka, Panu, 5,183,535, Cl. 162-19.000.
Sundstrand Corporation: *See*—
Rupnick, Charles J.; Stoddard, Damon R.; and Grindeland, David B., 5,182,949, Cl. 73-517.00B.
Supron, Steven A.: *See*—
Miller, Carl A.; Silverberg, Morton; and Supron, Steven A., 5,183,250, Cl. 271-222.000.
Surgicraft Limited: *See*—
Band, David M.; and Penman, David G., 5,183,043, Cl. 128-642.000.
Sutton, William T.: *See*—
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., 5,182,826, Cl. 5-453.000.
Suzaki, Tetsuyuki: *See*—
Henmi, Naoya; Suzaki, Tetsuyuki; and Saito, Tomoki, 5,184,243, Cl. 359-181.000.
Suzuki, Akira: *See*—
Fujii, Yoshihisa; Suzuki, Akira; Furukawa, Katsuki; and Shigeta, Mitsuhiro, 5,184,199, Cl. 257-77.000.
Suzuki Kabushiki Kaisha: *See*—
Horitani, Yoshihiro, 5,183,977, Cl. 181-266.000.
Suzuki, Keiko: *See*—
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,183,824, Cl. 514-383.000.
Suzuki, Kinya: *See*—
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, 5,183,543, Cl. 204-242.000.
Suzuki, Kunio: *See*—
Tomita, Nobuaki; and Suzuki, Kunio, 5,182,846, Cl. 29-527.200.
Suzuki, Maki: *See*—
Miyahara, Shoichiro; Shindo, Atsunori; Suzuki, Maki; Kusuhara, Nobumi; and Makiguchi, Nobuyoshi, 5,183,754, Cl. 435-226.000.
Suzuki, Masaaki; and Eshita, Tooru, to Mutoh Industries Ltd. Sheet-driven type automatic drafting machine. 5,182,861, Cl. 33-18.100.
Suzuki, Masato, to Amano Corporation. Two-color shifting device for printing ribbon. 5,183,345, Cl. 400-211.000.
Suzuki Motor Corp.: *See*—
Ayabe, Kazuhiko, 5,183,286, Cl. 280-688.000.
Hosoi, Keiji, 5,183,020, Cl. 123-406.000.
Suzuki, Shuzo: *See*—
Nishimura, Akira; Suzuki, Shuzo; and Shigematsu, Masayuki, 5,184,244, Cl. 359-187.000.
Suzuki, Tadashi: *See*—
Mima, Hiroshi; Suzuki, Tadashi; and Kubota, Yasuhiko, 5,182,902, Cl. 57-279.000.
Suzuki, Takumi: *See*—
Sano, Kazuyoshi; Fujimura, Koh; Suzuki, Takumi; and Tsutsui, Takashi, 5,184,239, Cl. 359-80.000.
Suzuki, Toshiharu: *See*—
Kitano, Kisei; Ushioda, Makoto; Uchida, Manabu; and Suzuki, Toshiharu, 5,183,587, Cl. 252-299.630.
Suzuki, Yoshiichi, to Showa Shell Sekiyu Kabushiki Kaisha. 2-trifluoromethyl-4-hydroxybenzoic acid. 5,183,934, Cl. 562-423.000.
Swann, James. Geometric toy construction system. 5,183,430, Cl. 446-104.000.
Swanson, Sandra K. M., to H. B. Fuller Company. Polyurea or polyurea-urethane adhesive for bonding elastomers. 5,183,877, Cl. 528-64.000.
Swedoor AB: *See*—
Persson, Goran, 5,183,622, Cl. 264-320.000.
Sweetana, Stephanie A.; and Grass, George M. Apparatus for in vitro determination of substances across membranes, biological tissues, or cell cultures. 5,183,760, Cl. 435-285.000.
Sweetheart Cup Company Inc.: *See*—
Maccherone, Larry, 5,182,896, Cl. 53-478.000.
SWF Auto-Electric GmbH: *See*—
Bohmer, Rainer; Bruhn, Rainer; Rienhardt, Hans-Peter; and Walther, Bernd, 5,182,957, Cl. 74-42.000.
Swift, Omar A.: *See*—
Poltorak, Jeffrey P.; and Swift, Omar A., 5,183,336, Cl. 366-273.000.
Symtek Systems, Inc.: *See*—
Twigg, Ray G.; Klug, Mark W.; Marrone, Santino; and Hawkes, Malcolm V., 5,184,068, Cl. 324-158.00F.
Syrop, Steven B.; and Israel, Howard. Fluid motion device (FMD) for exercising the temporomandibular joint. 5,183,057, Cl. 128-845.000.
Tachi-S Co., Ltd.: *See*—
Saito, Seishiro, 5,183,234, Cl. 248-430.000.
Tacticon Corp.: *See*—
Ramsey, John W., Jr., 5,183,222, Cl. 244-53.00R.
Tada, Takemi; Tanaka, Hirosi; and Usui, Osami, to Hitachi, Ltd. Pipe connection structure of a compressor. 5,183,400, Cl. 417-572.000.
Tada, Takemi: *See*—
Shimada, Toshio; Kobayashi, Morio; Tada, Takemi; and Kawaminami, Shigeya, 5,184,269, Cl. 361-24.000.
Tada, Yuji: *See*—
Nakacho, Yoshifumi; Inubushi, Akiyoshi; and Tada, Yuji, 5,183,716, Cl. 429-192.000.
Tadayon, Bijan; and Tadayon, Saied, to United States of America, Navy. Method for doping GaAs with high vapor pressure elements. 5,183,779, Cl. 437-165.000.
Tadayon, Saied: *See*—
Tadayon, Bijan; and Tadayon, Saied, 5,183,779, Cl. 437-165.000.
Taforo, Terrance: *See*—
Shaked, Ze'Ev; Stewart, Tracy; Hershenson, Susan; Thomson, James W.; Taforo, Terrance; and Thomson, Jody, 5,183,746, Cl. 435-69.510.
Taft, Morris E.; Anderton, Peter W.; and Maguire, Roy L., to Caterpillar Inc. Endless track chain for track-type vehicles. 5,183,318, Cl. 305-39.000.
Taga, Kazumitsu; Narukami, Toshihiko; and Miyaoku, Yoshiyuki, to House Food Industrial Co., Ltd. Method for preparing puff snack. 5,183,678, Cl. 426-448.000.
Tagoshi, Hirotaka: *See*—
Maruyama, Satoshi; Minorikawa, Naoki; Arakawa, Tsutomu; Yoshida, Haruo; Tagoshi, Hirotaka; and Abe, Kazuto, 5,183,917, Cl. 558-251.000.
Taguchi, Minoru, to Kabushiki Kaisha Toshiba. Semiconductor device having a charge transfer device, MOSFETs, and bipolar transistors—all formed in a single semiconductor substrate. 5,184,203, Cl. 257-370.000.
Taguchi, Nobuo: *See*—
Tamura, Koichi; Taguchi, Nobuo; and Tashiro, Satoshi, 5,183,675, Cl. 426-33.000.
Tai, Wun T.: *See*—
Hwa, Chih M.; Kelly, John A.; Tai, Wun T.; Fan, Lai-Duien G.; Kreh, Robert P.; and Greaves, Brian, 5,183,574, Cl. 210-701.000.
Taiyo Yuden Kabusikigaisha: *See*—
Shizuno, Hisamitsu; Kisi, Hirosi; Saito, Hirosi; and Fujii, Makoto, 5,184,277, Cl. 361-321.000.
Takagi, Haruo: *See*—
Aoki, Shinobu; Takagi, Haruo; and Okabe, Takanori, 5,184,201, Cl. 257-266.000.
Takagishi, Iwao, to Mitsubishi Kasei Corporation. Process for preparation of crystalline oxytitanium phthalocyanine showing A,B or C form. 5,183,886, Cl. 540-141.000.
Takahara, Shin: *See*—
Kageyama, Fumio; Kanazawa, Hirotaka; Takahara, Shin; and Morita, Toshiki, 5,183,127, Cl. 180-197.000.
Takahashi, Fusakichi: *See*—
Iida, Tadasato; Takahashi, Fusakichi; Wada, Kouji; and Nigo, Toshiro, 5,182,915, Cl. 62-89.000.
Takahashi, Nobuo: *See*—
Yoshida, Makoto; Yamada, Hironori; Takahashi, Nobuo; and Fujimoto, Kazushi, 5,183,708, Cl. 428-373.000.

Takahashi, Osamu; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material containing epoxy compound. 5,183,731, Cl. 430-551.000.

Takahashi, Tadashi; Furuya, Katsuhiko; Nakasima, Masaaki; and Enomoto, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographing light quantity controller for endoscope. 5,184,170, Cl. 354-413.000.

Takahashi, Tadashi: *See*—
Furuya, Katsuhiko; and Takahashi, Tadashi, 5,184,159, Cl. 354-62.000.

Takahashi, Takehiko; Iwata, Ryuji; and Shimizu, Yuji, to Combi Corporation. Infant restraining chair. 5,183,315, Cl. 297-488.000.

Takahashi, Tetsuroh: *See*—
Kurosawa, Makoto; Koseki, Masaaki; Takahashi, Tetsuroh; and Terakado, Takeshi, 5,183,454, Cl. 493-459.000.

Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, to Otsuka Electronic Co., Ltd. NMR measuring method and measuring apparatus for tissue of a living body. 5,183,045, Cl. 128-653.200.

Takano, Hiroe: *See*—
Kanai, Yasushi; Takano, Hiroe; Saoshita, Shushi; and Nitta, Atsumi, 5,184,266, Cl. 360-120.000.

Takano, Tetsuji: *See*—
Abe, Minoru; and Takano, Tetsuji, 5,183,141, Cl. 192-91.00A.

Takasaki, Kanetake, to Fujitsu Limited. Method of producing a semiconductor device. 5,183,778, Cl. 437-132.000.

Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Shinomoto, Shoji; and Nagai, Masahiko, to Shionogi & Co., Ltd. Process for producing methoxyiminoacetamide compounds and intermediates. 5,183,921, Cl. 558-301.000.

Takata Corporation: *See*—
Zushi, Takayasu, 5,183,615, Cl. 264-219.000.

Takayanagi, Yoshiaki; and Hirabayashi, Hiromitsu, to Canon Kabushiki Kaisha. Image recording apparatus having an interchangeable cartridge. 5,184,178, Cl. 355-202.000.

Takeda Chemical Industries, Ltd.: *See*—
Naito, Kenzo; Ishibashi, Yukio; and Shinbo, Haruo, 5,183,929, Cl. 560-178.000.
Naka, Takehiko; and Nishikawa, Kohei, 5,183,899, Cl. 548-253.000.
Notoya, Kohei; Yoshida, Keiji; and Yamazaki, Iwao, 5,183,570, Cl. 210-641.000.
Sasaki, Ichiro; Oshima, Junji; and Yamada, Minoru, 5,183,858, Cl. 525-308.000.
Sasaki, Ichiro; Oshima, Junji; and Yamada, Minoru, 5,183,859, Cl. 525-309.000.
Sohda, Takashi; and Ikeda, Hitoshi, 5,183,823, Cl. 514-358.000.

Takeda, Haruo, to Seiko Instruments, Inc. Tension type dynamic viscoelasticity measuring apparatus. 5,182,950, Cl. 73-811.000.

Takeda, Hiromitsu: *See*—
Masaki, Mitsuo; Takeda, Hiromitsu; Kamishiro, Toshiro; and Yamamoto, Masao, 5,183,811, Cl. 514-79.000.

Takeda, Tomoyuki: *See*—
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.

Takeda, Yoshihumi; and Hayashida, Akira, to Shin-Etsu Chemical Co., Ltd. Method for manufacturing a hafnium-containing silazane polymer and a method for manufacturing a ceramic from said polymer. 5,183,875, Cl. 528-33.000.

Takeguchi, Noriaki: *See*—
Hergert, Richard E.; Hergert, Richard R.; Neill, Eugene B.; Pantaleo, Scott B.; Roerig, Arnold J.; Rogers, Thomas D.; Shands, Jay A.; and Takeguchi, Noriaki, 5,183,537, Cl. 162-216.000.

Takehara, Koichi: *See*—
Wakino, Kikuo; Hishikawa, Toshio; Ishikawa, Youhei; Takehara, Koichi; and Tanizaki, Toru, 5,184,096, Cl. 333-175.000.

Takei, Michiko: *See*—
Doki, Masahiko; and Takei, Michiko, 5,183,777, Cl. 437-160.000.

Takeishi, Hideo; Houseki, Sigeki; and Matsubara, Isao, to Ohgi Paint Trading Co., Ltd. Electrostatic spray coating apparatus. 5,183,210, Cl. 239-703.000.

Takemura, Masashi: *See*—
Kaneko, Masahiro; Takemura, Masashi; and Yamashita, Kohei, 5,184,254, Cl. 360-10.200.

Takemura, Yasuo; Narimatsu, Osamu; and Komatsu, Kazuyoshi, to Mitsui Toatsu Chemicals, Inc. Wafer processing films. 5,183,699, Cl. 428-214.000.

Takenishi, Soichiro: *See*—
Yosomiya, Ryutoku; Hirata, Mistutoshi; Morimoto, Kiyotaka; Takenishi, Soichiro; and Marutsuka, Toshinori, 5,183,611, Cl. 264-129.000.

Takenouchi, Norio, to Sharp Kabushiki Kaisha. Signal generation circuit. 5,184,310, Cl. 364-550.000.

Takeshita, Katsuyoshi: *See*—
Fukushima, Hiroshi; Motonaga, Akira; Suda, Eriko; Nakajima, Mikito; Takeshita, Katsuyoshi; and Kutsukake, Yusuke, 5,183,870, Cl. 526-273.000.

Takeuchi, Hiroshi; Sendai, Tomoko; and Sakai, Yozo, to Mitsubishi Denki K.K. Electric discharge machining method. 5,183,988, Cl. 219-69.170.

Takeuchi, Hiroyuki; Nozokido, Tatsuo; and Nakamura, Chikako, to Hitachi Medical Corporation; and Hitachi, Ltd. Method for correcting phase errors in a nuclear magnetic resonance signal and device for realizing same. 5,184,073, Cl. 324-309.000.

Takeuchi, Yukihisa; Hirota, Toshikazu; Okada, Shigeki; and Shimogawa, Natsumi, to NGK Insulators, Ltd. Recording head including electrode supporting substrate having thin-walled contact end portion, and substrate-reinforcing layer. 5,184,344, Cl. 369-126.000.

Taki, Yosio: *See*—
Kondo, Isao; and Taki, Yosio, 5,182,850, Cl. 29-784.000.

Takiguchi, Yasuyuki: *See*—
Iimura, Haruo; Takiguchi, Yasuyuki; and Kanemoto, Akihiko, 5,184,237, Cl. 359-63.000.

Takuma, Keisuke: *See*—
Ohyama, Tsukasa; Shimokawa, Yasushi; Ghoda, Isamu; Takuma, Keisuke; and Koshida, Hitoshi, 5,183,474, Cl. 8-471.000.

Tamehiro, Hiroshi; Ogata, Yoshinori; and Terada, Yoshio, to Nippon Steel Corporation. Method of producing clad steel plate having good low-temperature toughness. 5,183,198, Cl. 228-186.000.

Tamor, Michael A.: *See*—
Potter, Timothy J.; Tamor, Michael A.; and Wu, Ching-Hsong, 5,183,529, Cl. 156-613.000.

Tamura, Aki: *See*—
Adachi, Masakazu; Saitou, Toshimitu; Murata, Kimiyo; and Tamura, Aki, 5,183,738, Cl. 435-7.100.

Tamura, Koichi; Taguchi, Nobuo; and Tashiro, Satoshi, to Nisshin Oil Mills, Ltd., The. Process for producing salad oil. 5,183,675, Cl. 426-33.000.

Tamura, Minoru: *See*—
Imaseki, Takashi; Tamura, Minoru; Iwata, Toru; and Fukuyama, Yuichi, 5,184,298, Cl. 364-424.050.

Tamura, Yoshinobu: *See*—
Kishi, Hiroyuki; Kimura, Hitoshi; Yamamoto, Katsuya; Tamura, Yoshinobu; Sakauchi, Tsuneo; Nagaoka, ;Masahide; and Tsuchiya, Yasuyu, 5,183,836, Cl. 523-404.000.

Tanaka, Hirokazu; and Ito, Koichi, to Mitsubishi Denki K.K. Overcharge preventive device for automotive batteries. 5,184,109, Cl. 340-455.000.

Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, to Mercian Corporation. Conjugate of adriamycin and cyclodextrin. 5,183,883, Cl. 563-6.400.

Tanaka, Hirosi: *See*—
Tada, Takemi; Tanaka, Hirosi; and Usui, Osami, 5,183,400, Cl. 417-572.000.

Tanaka, Kazuyoshi; Isobe, Toshifumi; Itaya, Masahiko; and Naganuma, Akiko, to Konica Corporation. Color image forming method and apparatus. 5,184,146, Cl. 346-1.100.

Tanaka Kikinzoku Kogyo KK: *See*—
Dalla Betta, Ralph A.; Ezawa, Nobuyasu; Tsurumi, Kazunori; Schlatter, James C.; and Nickolas, Sarento G., 5,183,401, Cl. 431-7.000.

Tanaka Kikinzoku Kogyo Kabushiki Kaisha: *See*—
Kitajima, Eiji; Oyama, Takashi; Maruden, Eiji; Teraoka, Hirokazu; Yamasaki, Haruki; and Shimizu, Susumu, 5,183,603, Cl. 264-29.200.

Tanaka, Shinji: *See*—
Kawamura, Yoshio; Tanaka, Shinji; Sato, Kazuo; Uchida, Kenko; and Kohida, Hiroyuki, 5,183,744, Cl. 435-30.000.

Tanaka, Tadashi; Sakamoto, Masaaki; Yamamoto, Koichi; and Kato, Tohru, to Daido Metal Company Ltd. Wear resistant copper alloys. 5,183,637, Cl. 420-479.000.

Tanaka, Tsugutoshi; and Ishiwata, Soji, to Nippon Aleph Corporation. Combination of magnetic card and printing apparatus therefor. 5,184,149, Cl. 346-74.200.

Tanaka, Yasuhiko: *See*—
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, 5,184,166, Cl. 354-400.000.

Tanaka, Yoshinori: *See*—
Utsunomiya, Atsushi; Nakamura, Mitsuo; Kuwatsuka, Toshiaki; and Tanaka, Yoshinori, 5,183,927, Cl. 560-115.000.

Tanaka, Yoshiyuki; and Itoh, Takaaki, to Mitsubishi Materials Corporation. Microgap type surge absorber. 5,184,273, Cl. 361-120.000.

Tanaka, Yukiomi: *See*—
Jisai, Yasuhiro; Tanaka, Yukiomi; and Shigeta, Akira, 5,183,601, Cl. 252-524.000.

Tang, Kuo-Tai. Steerable roller skate. 5,183,277, Cl. 280-11.280.

Taniguchi, Hiromichi, to NEC Corporation. Chip type solid electrolytic capacitor. 5,184,287, Cl. 361-540.000.

Taniguchi, Hitoshi; and Matsui, Fumio, to Pioneer Electronic Corporation. Light-sensitive recording medium and process for producing same. 5,183,726, Cl. 430-342.000.

Taniguchi, Seiichi: *See*—
Shiratori, Tetsuya; Yamazaki, Fumio; and Taniguchi, Seiichi, 5,183,425, Cl. 445-29.000.

Tanizaki, Toru: *See*—
Wakino, Kikuo; Hishikawa, Toshio; Ishikawa, Youhei; Takehara, Koichi; and Tanizaki, Toru, 5,184,096, Cl. 333-175.000.

Taoka Chemical Co. Ltd.: *See*—
Kawashita, Hideo; Ohta, Mituhiro; and Ogino, Kazuya, 5,183,501, Cl. 106-22.00D.

Tardy, Andre : *See*—
Brehm, Claude; Dupont, Philippe; and Tardy, Andre , 5,183,489, Cl. 65-4.200.

Tarica, Alexander G. Integrated building system and method. 5,182,884, Cl. 52-79.140.
Tarnoff, Harry L.: *See—*
Hull, Charles W.; Spence, Stuart T.; Albert, David J.; Smalley, Dennis R.; Harlow, Richard A.; Stinebaugh, Phil; Tarnoff, Harry L.; Nguyen, Hop D.; Lewis, Charles W.; Vorgitch, Tom J.; and Remba, David Z., 5,184,307, Cl. 364-474.240.
Tarr, Leonard; King, Gregory; and Johansen, Brian, to Monitel Products Corp. Photocopy monitoring system and method for monitoring copiers. 5,184,179, Cl. 355-206.000.
Tarui, Keiji: *See—*
Nishino, Hiromi; Tarui, Keiji; Toyoshi, Hideyuki; and Morita, Tatsuo, 5,183,725, Cl. 430-313.000.
Tasca, Jean-Pierre, to Compagnie Generale d'Automatisme CGA-HBS. Non-destructive eddy current test device using additive flux subtractive flux switching. 5,184,071, Cl. 324-238.000.
Tashiro, Minoru: *See—*
Sato, Takeshi; Tashiro, Minoru; and Miyakawa, Naoomi, 5,183,993, Cl. 219-121.820.
Tashiro, Satoshi: *See—*
Tamura, Koichi; Taguchi, Nobuo; and Tashiro, Satoshi, 5,183,675, Cl. 426-33.000.
Tatematsu, Susumu: *See—*
Kado, Syuji; Tatematsu, Susumu; and Ikuri, Hideyuki, 5,182,917, Cl. 62-137.000.
Tatomir, Paul J.: *See—*
Kich, Rolf; and Tatomir, Paul J., 5,184,098, Cl. 333-208.000.
Tatsumi, Setsuji, to Fuji Photo Film Co., Ltd. Image output system. 5,184,214, Cl. 358-75.000.
Tavazzani, Carlo: *See—*
Visani, Francesco; Tavazzani, Carlo; Ajroldi, Giuseppe; and Castiglioni, Giovanni, 5,183,851, Cl. 525-85.000.
Taylor, Chandler R., Jr.; Cale, Albert D., Jr.; and Stauffer, Harold F., Jr., to A. H. Robins Company, Incorporated. Method of treating muscular tension, muscle spasticity and anxiety with 3-aryloxy and 3-arylthioazetidinecarboxamides. 5,183,902, Cl. 548-950.000.
Taylor, Jeffrey L.; Luckenbach, Roy; Coco, Michael; and Twickler, Carl, to Dover Corporation. Barrier fabrics. 5,183,702, Cl. 428-266.000.
Taylor, Paul D.: *See—*
Liu, Kou-Chang; and Taylor, Paul D., 5,183,946, Cl. 568-670.000.
Taylor, Raymond L.; Burns, Lee E.; and MacDonald, James C., to CVD, Inc. Process for an improved laminated of ZnSe and ZnS. 5,183,689, Cl. 427-164.000.
Tazawa, Shigeru; and Shibata, Yutaka, to Tohoku Ricoh Co., Ltd. Method of printing bar codes by a bar code printer. 5,183,343, Cl. 400-103.000.
Technetics Corp.: *See—*
Howe, Harold, 5,183,197, Cl. 228-160.000.
Technical Development Associates: *See—*
Veith, Cary A., 5,183,874, Cl. 528-16.000.
Techsonic Industries, Inc.: *See—*
Adams, James W.; Loving, Louis S.; Betts, David A.; Donnelly, David P.; and Nunley, Alvin, III, 5,184,330, Cl. 367-111.000.
Tecumseh Products Company: *See—*
Jolliff, Norman E., 5,183,138, Cl. 192-4.00C.
von Kaler, Roland L.; and Havens, Dale I., 5,182,966, Cl. 74-606.00R.
Teijin Limited: *See—*
Yoshida, Makoto; Yamada, Hironori; Takahashi, Nobuo; and Fujimoto, Kazushi, 5,183,708, Cl. 428-373.000.
Teijin Seiki Co., Ltd.: *See—*
Ogawa, Kazunori, 5,183,071, Cl. 137-106.000.
Tektronix, Inc.: *See—*
Chism, Warren L., 5,184,065, Cl. 324-158.00P.
MacLane, Donald B.; Deur, Ted E.; Anderson, Jeffrey J.; Titterington, Donald R.; Oswald, James C.; and Meissner, Richard S., 5,184,147, Cl. 346-1.100.
Telectronics Pacing Systems, Inc.: *See—*
Nappholz, Tibor A.; Koestner, Ken; and Valenta, Harry L., Jr., 5,183,040, Cl. 128-419.0PG.
Telemecanique: *See—*
Guillin, Daniel; and Nicolas, Michel, 5,183,076, Cl. 137-513.700.
Lafosse, Jean; and Milliere, Paul, 5,183,971, Cl. 174-138.00F.
Tenbrink, Detlef; Bock, Martin; Heymann, Kurt; and Rimkus, Martin, to Schering Aktiengesellschaft. Method of forming a high temperature resistant copper coating on an inorganic dielectric. 5,183,553, Cl. 205-162.000.
Terada, Masahiro; Togano, Takeshi; Yamashita, Masataka; Iwaki, Takashi; Mori, Shosei; and Shinjo, Kenji, to Canon Kabushiki Kaisha. Ferroelectric chiral smectic liquid crystal composition and liquid crystal device using same. 5,183,586, Cl. 252-299.610.
Terada, Yoshio: *See—*
Tamehiro, Hiroshi; Ogata, Yoshinori; and Terada, Yoshio, 5,183,198, Cl. 228-186.000.
Terakado, Shingo, to Sanyo Electric Co., Ltd. Dry etching method. 5,183,531, Cl. 156-643.000.
Terakado, Takeshi: *See—*
Kurosawa, Makoto; Koseki, Masaaki; Takahashi, Tetsuroh; and Terakado, Takeshi, 5,183,454, Cl. 493-459.000.
Terao, Masanobu: *See—*
Nakamatsu, Toshio; Terao, Masanobu; Muneishi, Shigetoshi; Kometani, Norio; and Hayashi, Yoshiaki, 5,183,892, Cl. 546-76.000.
Teraoka, Hirokazu: *See—*
Kitajima, Eiji; Oyama, Takashi; Maruden, Eiji; Teraoka, Hirokazu; Yamasaki, Haruki; and Shimizu, Susumu, 5,183,603, Cl. 264-29.200.
Terry, James W.; and Rasmussen, John P., to United States of America, Air Force. Data distribution network. 5,184,138, Cl. 342-195.000.
Terwilliger, Richard A. Automatic biopsy instrument with cutting cannula. 5,183,052, Cl. 128-753.000.
Tesar, Herbert. Keycap overlay snap-on system. 5,183,346, Cl. 400-490.000.
Tetra Alfa Holdings SA: *See—*
Martensson, Lars; and Andersson, Jan, 5,183,644, Cl. 422-304.000.
Texaco Chemical Company: *See—*
Cuscurida, Michael; and Speranza, George P., 5,183,923, Cl. 560-26.000.
Knifton, John F.; and Sanderson, John R., 5,183,947, Cl. 568-698.000.
Marquis, Edward T.; Speranza, George P.; and Su, Wei-Yang, 5,183,514, Cl. 134-38.000.
Texaco Inc.: *See—*
Chien, Sze-Foo; and Traverse, Eugene F., 5,182,939, Cl. 73-29.010.
Holland, Douglas K.; and Dillingham, Edward W., 5,183,478, Cl. 48-197.00R.
Najjar, Mitri S.; and Hilmar, Martin D., 5,183,482, Cl. 55-16.000.
Texas Instruments Incorporated: *See—*
Dye, Thomas A., 5,184,320, Cl. 365-49.000.
Leach, Jerald G., 5,184,032, Cl. 307-443.000.
Lee, Jhang W., 5,183,776, Cl. 437-110.000.
Tsao, Sherman H., 5,184,133, Cl. 342-25.000.
Th. Goldschmidt AG: *See—*
Mohring, Volker; and Zellmer, Volker, 5,183,830, Cl. 521-107.000.
Thangavelu, Kandasamy, to Otis Elevator Company. "Up-peak" elevator channeling system with optimized preferential service to high intensity traffic floors. 5,183,981, Cl. 187-128.000.
Thelen, Wayne A.: *See—*
Hornburg, Kurt P.; Thelen, Wayne A.; and Thelen, William, 5,184,142, Cl. 343-715.000.
Thelen, William: *See—*
Hornburg, Kurt P.; Thelen, Wayne A.; and Thelen, William, 5,184,142, Cl. 343-715.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Rerailing device. 5,182,995, Cl. 104-2.000.
Thiel, Michael D.: *See—*
Raterman, Michael F.; and Thiel, Michael D., 5,183,480, Cl. 55-12.000.
Thierry, Mauricks; Pascal, Verrier; and Roland, Taillard, to Sollac. Steel having improved weldability and method thereof. 5,183,633, Cl. 420-92.000.
Thomas, Brian J., to Welch Allyn, Inc. Dental curing lamp. 5,184,044, Cl. 313-638.000.
Thomas, Charles E., to United Container Machinery Group, Inc. Heater for a double facing corrugating machine. 5,183,525, Cl. 156-470.000.
Thomas, Gerald F.: *See—*
Connolly, Jerome J.; Barrick, Michael D.; D'Agostino, William L.; Thomas, Gerald F.; and Williams, Thomas W., 5,184,141, Cl. 343-705.000.
Thomas, James M. C.; Stolpmann, James R.; Sutton, William T.; and Romano, James J., to SSI Medical Services, Inc. Method of blower control. 5,182,826, Cl. 5-453.000.
Thomas, Lloyd S.: *See—*
Stanbury, Evan J.; and Thomas, Lloyd S., 5,184,119, Cl. 340-825.600.
Thomas, Roy. Lighting accessory. 5,183,324, Cl. 362-103.000.
Thombs, David M., to Chu Associates, Inc. Ogival cross-section combined microwave waveguide for reflector antenna feed and spar support therefor. 5,184,144, Cl. 343-781.00R.
Thome, Jeanne M.: *See—*
Cox, Jerry D.; Linz, Raymond E.; Thome, Jeanne M.; Perry, Winfield B.; Hadley, Franklin O., Jr.; and Knobel, Vladimir A., 5,182,881, Cl. 51-7.000.
Thompson, Ralph A.: *See—*
Norlander, Norman E.; and Thompson, Ralph A., 5,183,089, Cl. 144-231.000.
Thomson Consumer Electronics, S.A.: *See—*
Heidebroek, Wolfgang; and Haing, Zeith W. C., 5,184,225, Cl. 358-243.000.
Thomson-CSF: *See—*
Lacroix, Michel, 5,184,250, Cl. 359-631.000.
Thomson, James W.: *See—*
Shaked, Ze'Ev; Stewart, Tracy; Hershenson, Susan; Thomson, James W.; Taforo, Terrance; and Thomson, Jody, 5,183,746, Cl. 435-69.510.
Thomson, Jody: *See—*
Shaked, Ze'Ev; Stewart, Tracy; Hershenson, Susan; Thomson, James W.; Taforo, Terrance; and Thomson, Jody, 5,183,746, Cl. 435-69.510.
Thonnesen, Dieter: *See—*
Hartel, Gunter; Schurfeld, Armin; Losing, Karl-Heinrich; Thonnesen, Dieter; and Remde, Ulrich, 5,182,942, Cl. 73-61.460.
Thorn Emi plc: *See—*
Wright, Graham L., 5,184,238, Cl. 359-70.000.
Thorp, Derek: *See—*
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Thorstensen, Peder J.: *See*—
Addison, F. Clark; and Thorstensen, Peder J., 5,183,995, Cl. 219-433.000.
Thunderline Corporation: *See*—
Barton, Bruce G., Jr., 5,182,885, Cl. 52-98.000.
Tice, Mark A.: *See*—
Zakaryan, Ara H.; Newallis, Peter E.; and Tice, Mark A., 5,183,916, Cl. 558-95.000.
Tikka, Panu, to Sunds Defibrator Rauma Oy. Process for preparing kraft pulp using black liquor pretreatment reaction. 5,183,535, Cl. 162-19.000.
Timmermans, Hans. Method and apparatus for compressing a stent prior to insertion. 5,183,085, Cl. 140-89.000.
Timoney, John F., to Cornell Research Foundation, Inc. Protection of equines against *Streptococcus equi*. 5,183,659, Cl. 424-92.000.
Ting, Chiu H.; and Pai, Pei-Lin, to Intel Corporation. Fully planar metalization process. 5,183,795, Cl. 437-230.000.
Tischner, Ryan K.: *See*—
Comstock, Roger D.; Tischner, Ryan K.; and Pearce, Wayne E., 5,183,182, Cl. 222-129.000.
Titterington, Donald R.: *See*—
MacLane, Donald B.; Deur, Ted E.; Anderson, Jeffrey J.; Titterington, Donald R.; Oswald, James C.; and Meissner, Richard S., 5,184,147, Cl. 346-1.100.
Toberg, Lloyd H. Stripper for wood incisor. 5,183,088, Cl. 144-2.00J.
Toda, Harumi: *See*—
Takamura, Susumu; Nakamura, Takashi; Okawauchi, Makoto; Toda, Harumi; Kanki, Ichiro; Yoshida, Minoru; Imoto, Toshiyuki; Negayama, Naomi; and Oka, Koichi, 5,183,045, Cl. 128-653.200.
Todokoro, Masatoshi, to Staff Co., Ltd. Toy facsimile machine. 5,183,431, Cl. 446-142.000.
Toffano, Gino: *See*—
della Valle, Francesco; and Toffano, Gino, 5,183,807, Cl. 514-25.000.
Togano, Takeshi: *See*—
Terada, Masahiro; Togano, Takeshi; Yamashita, Masataka; Iwaki, Takashi; Mori, Shosei; and Shinjo, Kenji, 5,183,586, Cl. 252-299.610.
Tohoku Ricoh Co., Ltd.: *See*—
Tazawa, Shigeru; and Shibata, Yutaka, 5,183,343, Cl. 400-103.000.
Toja, Emilio; Bonetti, Carla; Barzaghi, Fernando; and Galliani, Giulio, to Roussel Uclaf. Derivatives of 1,2,5,6-tetrahydropyridin-3-carboxaldehyde oxime. 5,183,896, Cl. 546-326.000.
Toja, Emilio: *See*—
Galliani, Giulio; Barzaghi, Fernando; Bonetti, Carla; and Toja, Emilio, 5,183,893, Cl. 546-133.000.
Tokai Kogyo Kabushiki Kaisha: *See*—
Arima, Hidetoshi, 5,183,522, Cl. 156-244.130.
Suita, Yoshihiro; and Ito, Tosikazu, 5,183,612, Cl. 264-145.000.
Tokai Rubber Industries, Ltd.: *See*—
Matsumoto, Nobuo, 5,183,243, Cl. 267-140.130.
Toko Kabushiki Kaisha: *See*—
Endo, Kunihisa, 5,184,105, Cl. 336-192.000.
Tokura, Seiichi: *See*—
Saiki, Ikuo; Nishi, Norio; Azuma, Ichiro; and Tokura, Seiichi, 5,183,804, Cl. 514-12.000.
Tokushu Kika Kogyo Co., Ltd.: *See*—
Goto, Yoshiaki; and Arai, Kozo, 5,183,650, Cl. 423-710.000.
Tokutake, Toshinori, to Showa Aluminum Kabushiki Kaisha. Heat exchanger. 5,183,103, Cl. 165-167.000.
Tokyo Automatic Machinery Works, Ltd.: *See*—
Kondo, Fumio, 5,183,148, Cl. 198-674.000.
Tokyo Electric Co., Ltd.: *See*—
Kurimoto, Yukuo; Fujii, Nobuhiko; Kohno, Mitunori; and Umebara, Takao, 5,183,135, Cl. 186-61.000.
Murakami, Kazunori; Ikumi, Tomonori; Matsumoto, Yasuo; and Iwafune, Yasuo, 5,184,245, Cl. 359-196.000.
Tokyo Electron Sagami Limited: *See*—
Asano, Takanobu; and Ishii, Katsumi, 5,183,378, Cl. 414-757.000.
Tokyo Kikai Seisakusho, Ltd.: *See*—
Shiba, Noriyuki; and Hayashi, Mamoru, 5,182,993, Cl. 101-365.000.
Tolton, Robert J. Process for forming fiberglass articles. 5,183,619, Cl. 264-257.000.
Tomaru, Mikio: *See*—
Komatsu, Kazunori; and Tomaru, Mikio, 5,183,686, Cl. 427-549.000.
Tomida, Yoshinori: *See*—
Yuasa, Satoshi; and Tomida, Yoshinori, 5,183,879, Cl. 528-503.000.
Tomita, Nobuaki; and Suzuki, Kunio, to Yamaha Corporation. Process for producing a diaphragm for acoustic appliances. 5,182,846, Cl. 29-527.200.
Tomiyasu, Hiroshi: *See*—
Fukakusa, Masaharu; and Tomiyasu, Hiroshi, 5,184,263, Cl. 360-103.000.
Tomoda, Akihiro: *See*—
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.
Tone, Hiroshi: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.
Tonoki, Satoshi: *See*—
Masuhra, Shohei; Tonoki, Satoshi; Shibukawa, Toshiya; and Sugawara, Hirsohi, 5,183,695, Cl. 428-151.000.
Topfer, Claus: *See*—
Claar, Klaus; Deischl, Hans; Lindmayer, Martin; Moczygemba, Jurgen; Schrader, Jergen; Schumacher, Josef; Topfer, Claus; and Robitschko, Peter, 5,184,022, Cl. 307-10.200.
Torisawa, Nobuyuki, to Fuji Photo Film Co., Ltd. Sheet feeding device for inverting a sheet. 5,183,241, Cl. 271-12.000.
Toriu, Mamoru; and Kitamura, Mitsuru, to Omron Tateisi Electronics Co.; and ITO Co., Ltd. Transcutaneous electric nerve stimulator. 5,183,041, Cl. 128-421.000.
Tosoh Corporation: *See*—
Tsutsumi, Yoshitaka; Uemura, Teruhisa; and Hasegawa, Masazumi, 5,183,722, Cl. 430-169.000.
Totoki, Toshio; Shigemi, Hirotake; and Yasukawa, Yoshio, to Kurita Water Industries Ltd. Apparatus for coagulating treatment. 5,183,562, Cl. 210-85.000.
Townley Foundry & Machine Co., Inc.: *See*—
Radon, Roman, 5,183,518, Cl. 148-324.000.
Townsend Engineering Company: *See*—
Townsend, Ray T.; and Basile, Vincent L., II, 5,183,433, Cl. 452-51.000.
Townsend, Harold E.: *See*—
Challberg, Roy C.; and Townsend, Harold E., 5,183,627, Cl. 376-352.000.
Townsend, Ray T.; and Basile, Vincent L., II, to Townsend Engineering Company. Sausage encasing machine having an improved looper horn. 5,183,433, Cl. 452-51.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Nakamura, Masanori; Hirakouchi, Hiroshi; Yatsuka, Takeshi; Kadowaki, Nobuo; and Endoh, Hiroshi, 5,183,863, Cl. 525-438.000.
Toyo Ink Mfg. Co., Ltd.: *See*—
Ishida, Roh, 5,184,213, Cl. 358-75.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Ohta, Norio; Oda, Yukio; Naya, Toshiaki; and Kasuga, Tomoyuki, 5,183,026, Cl. 125-11.160.
Toyosawa, Shinichi; Nakajima, Tadashi; Suzuki, Kinya; Kawagoe, Takahiro; Miyazaki, Tadaaki; Kitamura, Takashi; Fuse, Tadashi; Ogawa, Masao; Masuda, Yoshitomo; Daifuku, Hideharu; and Fujio, Ryota, to Bridgestone Corporation. Polyanilines, process for the preparation thereof and cells using them. 5,183,543, Cl. 204-242.000.
Toyoshi, Hideyuki: *See*—
Nishino, Hiromi; Tarui, Keiji; Toyoshi, Hideyuki; and Morita, Tatsuo, 5,183,725, Cl. 430-313.000.
Traeger, Joseph P.; Traeuger, Mark A.; and Traeger, Randolph J. Burning apparatus with pellet fuel burner. 5,183,028, Cl. 126-73.000.
Traeger, Randolph J.: *See*—
Traeger, Joseph P.; Traeuger, Mark A.; and Traeger, Randolph J., 5,183,028, Cl. 126-73.000.
Traeuger, Mark A.: *See*—
Traeger, Joseph P.; Traeuger, Mark A.; and Traeger, Randolph J., 5,183,028, Cl. 126-73.000.
Trageser, Martin: *See*—
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Traverse, Eugene F.: *See*—
Chien, Sze-Foo; and Traverse, Eugene F., 5,182,939, Cl. 73-29.010.
Treat, Russell L.; Gee, Glendon W.; and Whyatt, Greg A., to Battelle Memorial Institute. Method of draining water through a solid waste site without leaching. 5,183,355, Cl. 405-128.000.
Trent, Lane; and Shau, Gua-Ming. Self contained vivarium. 5,183,004, Cl. 119-5.000.
Triangle Engineered Products Co.: *See*—
Kuc, Victor D., 5,183,134, Cl. 184-6.160.
Tribotech: *See*—
Cain, Earl S., 5,184,207, Cl. 257-668.000.
Trico Products Corporation: *See*—
Carpenter, Peter J., 5,183,352, Cl. 403-79.000.
Knight, Stephen D., 5,182,831, Cl. 15-250.420.
Triple/S Dynamics, Inc.: *See*—
Sullivan, James F., Jr., 5,183,143, Cl. 198-370.000.
Triplett, Eric W., to Wisconsin Alumni Research Foundation. Recombinant Rhizobium bacteria inoculants. 5,183,759, Cl. 435-252.200.
Trudeau, Allen E., to United Technologies Corporation. Bi-functional transfer foot. 5,183,670, Cl. 425-126.100.
True Food Service Equipment, Inc.: *See*—
Trulaske, Robert J., Sr., 5,182,923, Cl. 62-249.000.
Trulaske, Robert J., Sr., 5,182,924, Cl. 62-255.000.
Trulaske, Robert J., Sr., to True Food Service Equipment, Inc. Refrigerator unit for food products. 5,182,923, Cl. 62-249.000.
Trulaske, Robert J., Sr., to True Food Service Equipment, Inc. Refrigerator unit for food products. 5,182,924, Cl. 62-255.000.
Trumbly, Joe H. Foldable propeller assembly. 5,183,384, Cl. 416-87.000.
Trussell, R. Rhodes: *See*—
Lang, John S.; Trussell, R. Rhodes; and Kawamura, Susumu, 5,183,335, Cl. 366-174.000.
Tsao, Sherman H., to Texas Instruments Incorporated. ISAR imaging radar system. 5,184,133, Cl. 342-25.000.
Tso, Chung C.; and Wynn, Robert L., to Phillips Petroleum Company. Benzylic oxidation and catalyst therefor. 5,183,931, Cl. 560-241.000.
Tsuchida, Hirofumi; and Aoki, Norihiko, to Olympus Optical Co., Ltd. Vari-focal lens system. 5,184,251, Cl. 359-654.000.
Tsuchiya, Keiji, to Canon Kabushiki Kaisha. Information recording-reproducing head driving circuit. 5,184,339, Cl. 369-44.280.

Tsuchiya, Shuichi: *See*—
Hori, Kimihiko; Sakaguchi, Akira; Ishida, Koichi; Nomura, Tomoko; Suzuki, Keiko; and Tsuchiya, Shuichi, 5,183,824, Cl. 514-383.000.
Tsuchiya, Yasuyu: *See*—
Kishi, Hiroyuki; Kimura, Hitoshi; Yamamoto, Katsuya; Tamura, Yoshinobu; Sakauchi, Tsuneo; Nagaoka, ;Masahide; and Tsuchiya, Yasuyu, 5,183,836, Cl. 523-404.000.
Tsukahara, Jiro: *See*—
Naito, Hideki; Yokoyama, Shigeki; and Tsukahara, Jiro, 5,183,729, Cl. 430-385.000.
Tsukude, Masaki: *See*—
Matsuda, Yoshio; Arimoto, Kazutami; Ooishi, Tsukasa; Tsukude, Masaki; and Fujishima, Kazuyasu, 5,184,327, Cl. 365-201.000.
Tsuru, Hiroyuki: *See*—
Iida, Yoshikazu; Kosaka, Toru; Tsuru, Hiroyuki; Higaki, Riichi; and Katayama, Akira, 5,184,167, Cl. 354-403.000.
Tsurumi, Kazunori: *See*—
Dalla Betta, Ralph A.; Ezawa, Nobuyasu; Tsurumi, Kazunori; Schlatter, James C.; and Nickolas, Sarento G., 5,183,401, Cl. 431-7.000.
Tsutsui, Takashi: *See*—
Sano, Kazuyoshi; Fujimura, Koh; Suzuki, Takumi; and Tsutsui, Takashi, 5,184,239, Cl. 359-80.000.
Tsutsumi, Michinari; Endo, Atsushi; and Yada, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Method for etching chromium film formed on substrate. 5,183,533, Cl. 156-656.000.
Tsutsumi, Yoshitaka; Uemura, Teruhisa; and Hasegawa, Masazumi, to Tosoh Corporation. Positive photosensitive composition for forming lenses containing 1,2-naphthoquinone diazide sulfonate photosensitizer, alkali-soluble resin and thermosetting agent and process for producing the composition. 5,183,722, Cl. 430-169.000.
Tucker, Robert E.: *See*—
Servido, John L.; Tucker, Robert E.; and Murphy, James, 5,183,483, Cl. 55-26.000.
Tung, Fu-Ching; Chen, Chi-Tsun; and Lieu, Sheng-Feng, to Industrial Technology Research Institute. Bagging specification adjustment and automatic inward-contraction and outward-expansion mechanism for bagging machine. 5,182,898, Cl. 53-570.000.
Tuot, James: *See*—
Carns, Lawrence G.; and Tuot, James, 5,182,926, Cl. 62-352.000.
Tury, Edward L.; Kaste, Keith; Johnson, Ross E.; and Danielson, David O., to Sensors, Inc. Method and apparatus for detecting a component gas in a sample. 5,184,017, Cl. 250-343.000.
Twickler, Carl: *See*—
Taylor, Jeffrey L.; Luckenbach, Roy; Coco, Michael; and Twickler, Carl, 5,183,702, Cl. 428-266.000.
Twigg, Ray G.; Klug, Mark W.; Marrone, Santino; and Hawkes, Malcolm V., to Symtek Systems, Inc. Electronic device test handler. 5,184,068, Cl. 324-158.00F.
Tyler, Thomas L. Flip-flop bird feeder. 5,183,005, Cl. 119-52.200.
Tyvela, Einar J. Universal chuck stop. 5,183,272, Cl. 279-156.000.
Tzukerman, Maty: *See*—
Pfahl, Magnus; and Tzukerman, Maty, 5,183,736, Cl. 435-6.000.
U-SUS Distributors, Inc.: *See*—
Gerbino, Anthony J., 5,183,710, Cl. 428-405.000.
Ube Cycon, Ltd.: *See*—
Akahoshi, Sumihisa; Akimura, Hitoshi; Nakabayashi, Isao; Ishii, Masami; Ohi, Tamio; and Yoshida, Makoto, 5,183,591, Cl. 252-503.000.
Yamaguchi, Soichiro; Matsuda, Koichi; and Goto, Hideo, 5,183,849, Cl. 525-68.000.
Ube Industries, Ltd.: *See*—
Koyama, Toshiya; Matsumoto, Yukio; Yoshimoto, Hataaki; and Ito, Katsuhiro, 5,183,585, Cl. 252-299.010.
Uchibori, Katsuyuki: *See*—
Abe, Tsuyoshi; Umezawa, Nobumasa; Fukuzumi, Tatsuo; Uchibori, Katsuyuki; Ozaki, Junji; and Motomura, Hiroharu, 5,183,634, Cl. 420-110.000.
Uchida, Hirofumi: *See*—
Wada, Norio; Fukase, Katsuya; and Uchida, Hirofumi, 5,183,711, Cl. 428-596.000.
Uchida, Kazuyuki: *See*—
Saitoh, Kouji; and Uchida, Kazuyuki, 5,184,162, Cl. 324-158.00R.
Uchida, Kenko: *See*—
Kawamura, Yoshio; Tanaka, Shinji; Sato, Kazuo; Uchida, Kenko; and Kohida, Hiroyuki, 5,183,744, Cl. 435-30.000.
Uchida, Makio, to Hitachi, Ltd. Semiconductor integrated circuit device. 5,184,202, Cl. 257-390.000.
Uchida, Manabu: *See*—
Kitano, Kisei; Ushioda, Makoto; Uchida, Manabu; and Suzuki, Toshiharu, 5,183,587, Cl. 252-299.630.
Uchida, Naoshi: *See*—
Oyama, Jun; and Uchida, Naoshi, 5,184,100, Cl. 335-16.000.
Ueda, Hideaki, to Minolta Camera Kabushiki Kaisha. Photosensitive member comprising specific distyryl compound. 5,183,718, Cl. 430-59.000.
Ueda, Shuji; and Mochida, Shoro, to Matsushita Electric Industrial Co., Ltd. Optical code reader. 5,184,004, Cl. 235-462.000.
Ueda, Toshio; Sato, Yuichi; Senda, Masayasu; Isoyama, Seiji; and Hisano, Seiichi, to Dowa Mining Co., Ltd. Process for production of permanent magnet alloy having improved resistence to oxidation. 5,183,630, Cl. 419-31.000.
Uemura, Teruhisa: *See*—
Tsutsumi, Yoshitaka; Uemura, Teruhisa; and Hasegawa, Masazumi, 5,183,722, Cl. 430-169.000.
Uenishi, Akio, to Mitsubishi Denki Kabushiki Kaisha. Electronic flash device. 5,184,171, Cl. 354-416.000.
Ueno, Isamu, to Canon Kabushiki Kaisha. Photoelectric conversion apparatus having clock signals of different frequencies. 5,184,006, Cl. 250-208.100.
Ueno, Shuji; Hagiwara, Michiaki; Mishima, Ryoji; and Isoishi, Kiyoshi, to Unitika Ltd.; and Mitsubishi Kasei Corporation. Fibrous anisotropic permanent magnet and production process thereof. 5,183,515, Cl. 148-101.000.
Uesaka, Kazuo; Okita, Kazumasa; and Arai, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha; and Okitsumo Incorporated. Deodorant and product in which the deodorant is used. 5,183,656, Cl. 424-76.100.
Ukai, Naoki; and Mori, Koji, to Nippondenso Co. Ltd. Non-decoded type bar code reading apparatus. 5,184,005, Cl. 235-472.000.
Ullmann, Agnes: *See*—
Danchin, Antoine; Glaser, Philippe; Krin, Evelyne; Barzu, Octavien; Ladant, Daniel; and Ullmann, Agnes, 5,183,745, Cl. 435-69.100.
Ulrich, Peter R.: *See*—
Holler, Roger A.; and Ulrich, Peter R., 5,183,217, Cl. 242-47.000.
Umebara, Takao: *See*—
Kurimoto, Yukuo; Fujii, Nobuhiko; Kohno, Mitunori; and Umebara, Takao, 5,183,135, Cl. 186-61.000.
Umeda, Shinichiro: *See*—
Kuwajima, Teruaki; Umeda, Shinichiro; and Konishi, Sakuichi, 5,183,504, Cl. 106-404.000.
Umeda, Tomoshige: *See*—
Nishide, Tsutomu; Yasumura, Daisuke; Nakajima, Yoshinobu; Onodera, Akiko; Yasukawa, Takuji; Kokumai, Hirokazu; Umeda, Tomoshige; Nomura, Seiji; and Mori, Hideki, 5,183,750, Cl. 435-134.000.
Umetsu, Sachio; and Miura, Toshihiko, to Canon Kabushiki Kaisha. Method for assembling objects by reversing up and down an attitude of the assembly. 5,182,843, Cl. 29-445.000.
Umetsu, Takao: *See*—
Shiina, Michihiro; Tanaka, Yasuhiko; Iwai, Fumio; Noguchi, Yukio; Umetsu, Takao; Saito, Tatsuo; Onozuka, Haruo; Saitoh, Muneyoshi; and Koda, Takao, 5,184,166, Cl. 354-400.000.
Umezawa, Nobumasa: *See*—
Abe, Tsuyoshi; Umezawa, Nobumasa; Fukuzumi, Tatsuo; Uchibori, Katsuyuki; Ozaki, Junji; and Motomura, Hiroharu, 5,183,634, Cl. 420-110.000.
Umlauft, Helmut; and Wager, Karl-Heinz, to Head Sportgerate Gesellschaft m.b.H. & Co. OHG. Racquets, in particular tennis racquets. 5,183,265, Cl. 273-73.00C.
Ungar, Israel S.: *See*—
Scher, Herbert I.; Ungar, Israel S.; and Baehr, Richard R., Jr., 5,183,600, Cl. 264-26.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Bryant, David R.; Babin, James E.; Nicholson, James C.; and Weintritt, Donald J., Jr., 5,183,943, Cl. 568-454.000.
Etzkorn, William G.; and Harkreader, Gordon G., 5,183,936, Cl. 562-532.000.
United Container Machinery Group, Inc.: *See*—
Thomas, Charles E., 5,183,525, Cl. 156-470.000.
United Foam Plastics: *See*—
Hojnacki, Robert J.; Pearson, Daniel C.; Brucker, Gerard K.; Gober, Michael J.; and Shaw, Daniel J., Jr., 5,183,159, Cl. 206-583.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Kerry, Stephen; Restall, James E., deceased; and Wood, Michael I., 5,183,635, Cl. 420-420.000.
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United States of America
Agriculture: *See*—
Carr, Merle E.; Doane, William M.; Wing, Robert E.; and Bagley, Edward B., 5,183,690, Cl. 427-213.310.
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Terry, James W.; and Rasmussen, John P., 5,184,138, Cl. 342-195.000.
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Kraus, Matthias H.; and Aaronson, Stuart A., 5,183,884, Cl. 536-23.500.
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Hawsey, Robert A.; and Scudiere, Matthew B., 5,184,189, Cl. 356-218.000.
MacArthur, Duncan W.; Wolf, Michael A.; McAtee, James L.; Unruh, Wesley P.; Cucchiara, Alfred L.; and Huchton, Roger L., 5,184,019, Cl. 250-380.000.
Health and Human Services: *See*—
Kindt, Thomas J.; Kulaga, Henrietta; and Folks, Thomas M., 5,183,949, Cl. 800-2.000.
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Holler, Roger A.; and Ulrich, Peter R., 5,183,217, Cl. 242-47.000.
Ligler, Frances S.; Gaber Bruce P.; Kusterbeck, Anne W.; and Wemhoff, Gregory A., 5,183,740, Cl. 435-7.320.
Sitzmann, Michael E., 5,183,938, Cl. 564-151.000.
Sullivan, Michael J.; and Dussault, Douglas G., 5,184,331, Cl. 367-135.000.
Tadayon, Bijan; and Tadayon, Saied, 5,183,779, Cl. 437-165.000.

U.S. Philips Corporation: *See*—
Conrads, Norbert; Schiebel, Ulrich; and Wieczorek, Herfried, 5,184,018, Cl. 250-370.090.
de Vaan, Adrianus J. S. M.; and van den Brandt, Adrianus H. J., 5,184,248, Cl. 359-483.000.
Hazan, Jean-Pierre; Polaert, Remy; and Delmas, Gilles, 5,183,996, Cl. 219-452.000.
Kinghorn, John R.; and Stevens, Jeremy R., 5,184,220, Cl. 358-147.000.
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United Technologies Automotive, Inc.: *See*—
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United Technologies Corporation: *See*—
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Unitika Ltd.: *See*—
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University of Arkansas, The Board of Trustees of the: *See*—
Crawford, Jack T.; Eisenach, Kathleen D.; Cave, M. Donald; and Bates, Joseph H., 5,183,737, Cl. 435-6.000.
University of California, The Regents of the: *See*—
Arakawa, Mitsuaki; and Hawryszko, Christine, 5,184,074, Cl. 324-309.000.
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University of Minnesota, Regents of the: *See*—
Erdman, Arthur G.; Rekow, Elizabeth D.; Riley, Donald R.; Klamecki, Barney; Zhu, Yang; and Ahn, Jeong-Ho, 5,184,306, Cl. 364-474.050.
University of Nebraska, Board of Regents of the: *See*—
Markwell, John P.; Versaw, Wayne K.; Osterman, John C.; and Kelley, Philip M., 5,183,752, Cl. 435-196.000.
University of Pennsylvania, The Trustees of the: *See*—
Hoffman, Eric A.; Hanson, C. William, III; and Ward, Charles F., III, 5,183,038, Cl. 128-204.210.
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Weisz, Paul B.; Shing, Yuen W.; and Folkman, Judah, 5,183,809, Cl. 514-58.000.
University of Virginia Alumni Patents Foundation: *See*—
Kennington, Alison S.; and Larner, Joseph, 5,183,764, Cl. 436-131.000.
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Beach, Kirk W.; Phillips, David J.; and Kansky, John, 5,183,046, Cl. 128-661.070.
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Unno, Yasuyuki; Orii, Seiji; and Yonekawa, Masami, to Canon Kabushiki Kaisha. Projection exposure apparatus with an aberration compensation device of a projection lens. 5,184,176, Cl. 355-52.000.
Uno, Masaru: *See*—
Yamaguchi, Akira; Uno, Masaru; Sekikawa, Norio; Arai, Fumio; and Matsuzaki, Kenji, 5,183,484, Cl. 55-34.000.
Uno, Nayomon; and Mutaguchi, Masao, to Ishikawajima-Harima Heavy Industries Co., Ltd. Vibration damping system. 5,182,887, Cl. 52-167.00R.
Unruh, Wesley P.: *See*—
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Urasaki, Shuji: *See*—
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Urda, Paul, to Ingersoll-Rand Company. Belt sander tensioner. 5,183,441, Cl. 474-138.000.
Ushijima, Kunio: *See*—
Hamada, Yasunori; Oizumi, Junichi; Noda, Kousuke; and Ushijima, Kunio, 5,184,000, Cl. 235-379.000.
Ushioda, Makoto: *See*—
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Usui, Osami: *See*—
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Utsunomiya, Atsushi; Nakamura, Mitsuo; Kuwatsuka, Toshiaki; and Tanaka, Yoshinori, to Mitsui Toatsu Chemicals Incorporated. Process for the preparation of iodoalkynyl carbamates. 5,183,927, Cl. 560-115.000.
Valenta, Harry L., Jr.: *See*—
Nappholz, Tibor A.; Koestner, Ken; and Valenta, Harry L., Jr., 5,183,040, Cl. 128-419.0PG.
Valeo Thermique Moteur: *See*—
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Valyocsik, Ernest W.: *See*—
Chitnis, Girish K.; Herbst, Joseph A.; and Valyocsik, Ernest W., 5,183,790, Cl. 502-67.000.
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de Vaan, Adrianus J. S. M.; and van den Brandt, Adrianus H. J., 5,184,248, Cl. 359-483.000.
Vanderlinde, William: *See*—
Jakse, Frank P.; Morris, Donald E.; and Vanderlinde, William, 5,183,918, Cl. 558-271.000.
Vandome, Jacques: *See*—
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Van Gorsel, Jan, to U.S. Philips Corporation. Differential amplifier having output current limiting. 5,184,089, Cl. 330-254.000.
VanSweden, Harry, to General Dynamics Land Systems, Inc. Suspension system for road wheel of a track laying vehicle. 5,183,287, Cl. 280-705.000.
van't Riet, Bartholomeus; Elford, Howard L.; and Wampler, Galen L. Polyhydroxybenzoic acid derivatives. 5,183,828, Cl. 514-508.000.
Van Wijngaarden, Ineke; Hamminga, Derk; and Wouters, Wouter, to Duphar International Research B.V. Substituted 3,4-annelated benzimidazol-2(1H)-ones. 5,183,822, Cl. 514-305.000.
Vartuli, James C.: *See*—
Kresge, Charles T.; Leonowicz, Michael E.; Roth, Wieslaw J.; Vartuli, James C.; Keville, Kathleen M.; Shih, Stuart S.; Degnan, Thomas F.; Dwyer, Francis G.; and Landis, Michael E., 5,183,561, Cl. 208-251.00R.
Vasconcellos, Stephen R.; Boyce, P. Douglas; and Smith, Larry P., to Betz Laboratories, Inc. Methods for the flocculation of coal fines and insoluble metals in coal mine waters. 5,183,575, Cl. 210-724.000.
Vasconcellos, Stephen R.: *See*—
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Vavra, Paul P. Packaging system for a toilet water tank and cover. 5,183,155, Cl. 206-320.000.
Veitch, Ronald J.: *See*—
Schwab, Ekkehard; Veitch, Ronald J.; and Auweter, Helmut, 5,183,709, Cl. 428-404.000.
Veith, Cary A., to Technical Development Associates. Polyorganosiloxane-polyamide block copolymers. 5,183,874, Cl. 528-16.000.
Venepalli, Bhaskar R.: *See*—
Mattes, Kenneth C.; and Venepalli, Bhaskar R., 5,183,813, Cl. 514-150.000.
Venter, Jeremia J.; and McDade, Christine, to Rohm and Haas Company. Transesterification catalyst. 5,183,930, Cl. 560-217.000.
Vepex Contractor Ltd.: *See*—
Simoncsits, Andras; Kalman, Miklos; Kari, Csaba; and Cserpan, Imre, 5,183,748, Cl. 455-91.000.
Vering, Anthony W.: *See*—
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Verosol USA Inc.: *See*—
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VG Instruments Group Limited: *See*—
Ronan, Gerard A.; and Cole, Alistair, 5,184,016, Cl. 250-288.000.
Viaud, Jean, to Deere & Company. Round baler with tracking control for traction means used to move crop for baling. 5,182,987, Cl. 100-87.000.
Vickers, Incorporated: *See*—
Hansen, Lowell D., 5,183,392, Cl. 417-203.000.
Vicknair, Bruce A.; and Baten, Robert A., to Stewart & Stevenson Services, Inc. Encapsulated meter with optical programmer. 5,184,064, Cl. 324-156.000.
Victor Company of Japan, Ltd.: *See*—
Kaneko, Masahiro; Takemura, Masashi; and Yamashita, Kohei, 5,184,254, Cl. 360-10.200.
Nishi, Yuji; Ito, Shigehiro; Kuguchi, Tatsushi; and Ebihara, Kazuyuki, 5,184,221, Cl. 358-167.000.
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Vidano, Paul: *See*—
Stancliffe, A. Colin; Vidano, Paul; and Pogue, Bill P., 5,183,106, Cl. 165-166.000.
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Viksne, George J., to Wacker Silicones Corporation. Room temperature stable organopolysiloxane compositions. 5,183,873, Cl. 528-16.000.
Villalta, Josue J.; and Passemard, Jean R. Medical retractor device. 5,183,032, Cl. 128-20.000.
Villwock, Thomas: *See*—
Kaneda, Takashi; and Villwock, Thomas, 5,184,282, Cl. 361-395.000.
Vilter Manufacturing Corporation: *See*—
Langouet, Luc, 5,183,395, Cl. 417-310.000.
Vincent, John. Motorcycle safety harness. 5,183,007, Cl. 119-96.000.
Viola, John. Truck mounted pavement sweeping brush. 5,182,830, Cl. 15-78.000.
Virstec Thin Films, Inc.: *See*—
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Virga, Kathleen L.: *See*—
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Virkar, Anil V.; and Fung, Kuan-Zong, to Gas Research Institute. Stabilized bismuth oxide. 5,183,801, Cl. 501-152.000.

Visani, Francesco; Tavazzani, Carlo; Ajroldi, Giuseppe; and Castiglioni, Giovanni, to ELF Atochem Italia S.r.l. Low haze transparent compositions and processes for preparing them. 5,183,851, Cl. 525-85.000.

Vitagliano, Vincenzo M.: *See*—
Guerra, Gaetano; Vitagliano, Vincenzo M.; Corradini, Paolo; and Albizzati, Enrico, 5,183,853, Cl. 525-132.000.

Vito, Emanuel T. Mechanized animal litter apparatus and method of operating. 5,183,009, Cl. 119-165.000.

Vittorio, David A.; and Reedy, Steven W., to Cummins Engine Co., Inc. Master cylinder with two-piece master piston. 5,183,018, Cl. 123-321.000.

Vivascan Corporation: *See*—
Harjunmaa, Hannu; Mendelson, Yitzhak; and Wang, Yi, 5,183,042, Cl. 128-633.000.

Vives, Van C., to Phillips Petroleum Company. Poly(arylene sulfide) composition and method using silica to reduce drool. 5,183,844, Cl. 524-423.000.

Voest-Alpine Industrienlagenbau Gesellschaft m.b.H.: *See*—
Wizani, Wolfgang; Esterbauer, Hermann; Steiner, Walter; and Gomes, Joseph, 5,183,753, Cl. 435-201.000.

Vogt, Karl-Heinz: *See*—
Karius, Klaus D.; Eskam, Armin; and Vogt, Karl-Heinz, 5,183,962, Cl. 102-489.000.

Vollert, Alfred, to Fabrique Ebel SA. Sealed control arrangement for a timepiece. 5,184,334, Cl. 368-319.000.

Vollmann, Norbert C.: *See*—
Muller, Johannes C. A.; and Vollmann, Norbert C., 5,184,259, Cl. 360-85.000.

von Kaler, Roland L.; and Havens, Dale L., to Tecumseh Products Company. Control mechanism for a hydrostatic transaxle. 5,182,966, Cl. 74-606.00R.

Vorgitch, Tom J.: *See*—
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Voss, Karl D., to CMI International, Inc. Method for metallurgically bonding pressed-in cylinder liners to a cylinder block. 5,182,854, Cl. 29-888.061.

Vought Aircraft Company: *See*—
Connolly, Jerome J.; Barrick, Michael D.; D'Agostino, William L.; Thomas, Gerald F.; and Williams, Thomas W., 5,184,141, Cl. 343-705.000.

W. Haking Enterprises Limited: *See*—
Wagerer, Helmut, 5,184,163, Cl. 354-266.000.

W. R. Grace & Co.-Conn.: *See*—
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Carter, Charles G.; Jovancicevic, Vladimir; Hartman, Judith A.; and Kreh, Robert P., 5,183,590, Cl. 252-392.000.
Hwa, Chih M.; Kelly, John A.; Tai, Wun T.; Fan, Lai-Duien G.; Kreh, Robert P.; and Greaves, Brian, 5,183,574, Cl. 210-701.000.
Kreh, Robert P.; and Henry, Wayne L., 5,183,573, Cl. 210-697.000.
Samuel, David N.; and Williams, Richard S., 5,183,848, Cl. 525-57.000.

W. Schlafhorst AG & Co.: *See*—
Gronenberg, Reinhard, 5,184,305, Cl. 364-470.000.
Horak, Dieter; and Schafer, Hans-Heinz, 5,182,900, Cl. 57-22.000.

Wack, Helmut. Demolishing apparatus. 5,183,216, Cl. 241-101.700.

Wacker Silicones Corporation: *See*—
Viksne, George J., 5,183,873, Cl. 528-16.000.

Wada, Kouji: *See*—
Iida, Tadasato; Takahashi, Fusakichi; Wada, Kouji; and Nigo, Toshiro, 5,182,915, Cl. 62-89.000.

Wada, Masayuki: *See*—
Suda, Koichi; Matsuzaki, Hitoshi; Wada, Masayuki; and Ozeki, Shoichi, 5,184,272, Cl. 361-87.000.

Wada, Norio; Fukase, Katsuya; and Uchida, Hirofumi, to Shinko Electric Industries Co., Ltd. Automatic bonding tape used in semiconductor device. 5,183,711, Cl. 428-596.000.

Wada, Noriyuki; and Nishigaki, Takayuki, to NOK Corporation. Sealing device and manufacturing method of the same. 5,183,271, Cl. 277-152.000.

Wada, Satoshi: *See*—
Ono, Takeshi; Yoshida, Takehiro; Wada, Satoshi; Takeda, Tomoyuki; Kondo, Masaya; Kobayashi, Makoto; Kato, Takahiro; Awai, Takashi; Ishida, Yasushi; Tomoda, Akihiro; Yokoyama, Minoru; and Yamada, Masakatsu, 5,184,151, Cl. 346-76.0PH.

Wada, Yukio: *See*—
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Wade, Merle W., Jr. Recycling trash can. 5,183,278, Cl. 280-47.350.

Wager, Karl-Heinz: *See*—
Umlauft, Helmut; and Wager, Karl-Heinz, 5,183,265, Cl. 273-73.00C.

Wagerer, Helmut, to W. Haking Enterprises Limited. Remote trigger method and apparatus for a camera shutter. 5,184,163, Cl. 354-266.000.

Wagner International AG: *See*—
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Wagner, Klaus; Hanssler, Gerd; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Pesticidal nitro-substituted benzothiazolones. 5,183,898, Cl. 548-178.000.

Wagner, Richard C., to Hollymatic Corporation. Automated citrus fruit juice press. 5,182,984, Cl. 99-509.000.

Wagner Spray Tech Corporation: *See*—
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Wakatake, Koichi, to Kabushiki Kaisha Nittec; and Mitsui Pharmaceuticals, Inc. Automatic immunity analysis apparatus with magnetic particle separation. 5,183,638, Cl. 422-64.000.

Wakino, Kikuo; Hishikawa, Toshio; Ishikawa, Youhei; Takehara, Koichi; and Tanizaki, Toru, to Murata Manufacturing Co., Ltd. Parallel connection multi-stage band-pass filter comprising resonators with impedance matching means capacitively coupled to input and output terminals. 5,184,096, Cl. 333-175.000.

Walker, Grant A.: *See*—
Walker, Wayne E.; and Walker, Grant A., 5,183,230, Cl. 248-118.000.

Walker, Roger C.: *See*—
Gilchrist, Alan R.; Sullivan, Thomas J.; and Walker, Roger C., 5,182,906, Cl. 60-226.100.

Walker, Wayne E.; and Walker, Grant A., to Fox Bay Industries, Inc. Computer keyboard support with padded wrist support. 5,183,230, Cl. 248-118.000.

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DuBois, Samuel C., 5,183,636, Cl. 420-442.000.

Walsh, Thomas F.: *See*—
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Walt Disney Company, The: *See*—
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Walter, George E., to Moore Business Forms, Inc. Repair sealer accessory. 5,183,526, Cl. 156-556.000.

Walter Kidde Aerospace, Inc.: *See*—
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Walther, Bernd: *See*—
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Wampler, Galen L.: *See*—
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Wang, Leao, to Greenmaster Industrial Corp. Foot training machine. 5,183,448, Cl. 482-52.000.

Wang, Li; and Mitsche, Roy T., to Allied-Signal Inc. Catalyst for making polyethylene. 5,183,792, Cl. 502-242.000.

Wang, Yi: *See*—
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Wanger, Mark E.; Methlie, Jennifer L.; Stavely, Donald J.; and Oliver, Thomas C., to Hewlett-Packard Company. Mechanical assembly for alternately producing displacement of a carriage and rotation of a carriage mounted gear. 5,184,336, Cl. 369-34.000.

Wanninger, Paul; Wild, Richard; Kleinschmidt, Ernst; and Spath, Helmut, to Messerschmitt-Bolkow-Blohm GmbH. Explosive charge. 5,183,520, Cl. 149-19.910.

Ward, Charles F., III: *See*—
Hoffman, Eric A.; Hanson, C. William, III; and Ward, Charles F., III, 5,183,038, Cl. 128-204.210.

Warner, John L. Guide for portable power saw. 5,182,975, Cl. 83-745.000.

Warner-Lambert Company: *See*—
Chen, Evan N., 5,182,858, Cl. 30-85.000.

Warren, Bobby G., Jr.; and Davis, James D. Access and support apparatus for loading and unloading gondola cars. 5,183,369, Cl. 414-339.000.

Warwel, Siegfried; Jagers, Hans-Gerd; and Deckers, Andreas, to Huels Aktiengesellschaft. Catalysts for the metathesis of olefins and functionalized olefins. 5,183,791, Cl. 502-102.000.

Washburn, Robert D.; Wedeen, Robert S.; McClanahan, Robert F.; Council, William J.; and Lusher, David M., to Hughes Aircraft Company. High frequency poly-phase rectifier for converting AC power signal to DC. 5,184,288, Cl. 363-4.000.

Washuttl, Josef; and Viebahn, Renate, to Dr. J. Hansler GmbH. Process for the production of stable ozonized oils from unsaturated vegetable oils. 5,183,911, Cl. 554-181.000.

Wasser, Steven A., to Verne O. Powell Flutes, Inc. Cushion for a tone hole pad. 5,183,954, Cl. 84-385.00P.

Wasson, Robert C.: *See*—
O'Neil, Robert M.; Phillips, Emyr; and Wasson, Robert C., 5,183,842, Cl. 524-288.000.

Wasyliw, Basil: *See*—
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Watai, Hiroo: *See*—
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Watanabe, Hayataro, to Y.M. Golf Course Equipment Co., Ltd. Lawn cutting apparatus. 5,183,120, Cl. 172-21.000.

Watanabe, Hisanori; and Ito, Shinji, to Sony Corporation. Dual motor mode switching mechanism for a recording and/or reproducing apparatus. 5,184,262, Cl. 360-96.200.

Watanabe, Mikio: *See*—
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Watanabe, Tamio: *See*—
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Watson, John, to British Technology Group Limited. Underwater inspection apparatus and method. 5,184,230, Cl. 359-9.000.
Watt, Darrel J.: *See*—
Robbins, E. Stanley; Robbins, Rodney W.; Watt, Darrel J.; and Wilson, Wendell G., 5,182,948, Cl. 73-429.000.
Wattenburg, Willard H., to University of California, Regents of the. Anti-snag plowing system. 5,183,119, Cl. 171-105.000.
WavePhore, Inc.: *See*—
Gerdes, Richard C., 5,184,218, Cl. 358-133.000.
Wavin B.V.: *See*—
Menheere, Johannes C. J., 5,182,954, Cl. 73-864.450.
Waynert, Joseph A.: *See*—
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Wehking, Timothy J.: *See*—
Bailey, Kenneth M.; Mitchener, Rex L.; Wehking, Timothy J.; and Reith, Craig P., 5,182,940, Cl. 73-36.000.
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Durand, David; Vieau, David P.; Wei, Tai S.; and Chu, Ang-Ling, 5,183,593, Cl. 252-514.000.
Weidemeier, Klaus: *See*—
Gross, Lutz-Werner; Poth, Ulrich; Hille, Dieter; and Weidemeier, Klaus, 5,183,835, Cl. 523-402.000.
Weider, Richard; and Scholl, Thomas, to Bayer Aktiengesellschaft. Process for the preparation of aromatic dicarboxylic acids and aromatic hydrocarbons. 5,183,926, Cl. 560-76.000.
Weigel, Leland O., to Eli Lilly and Company. Process and intermediates for chiral epoxides. 5,183,910, Cl. 549-539.000.
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Weir, Roy A. Oral hygiene device. 5,183,035, Cl. 128-66.000.
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Thomas, Brian J., 5,184,044, Cl. 313-638.000.
Weldon, William F.; Woodson, Herbert H.; and Long, Glen C., to Board of Regents, The University of Texas System. Method and construction for control of current distribution in railgun armatures. 5,183,957, Cl. 89-8.000.
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Schleigh, William R.; and Welter, Thomas R., 5,183,894, Cl. 546-273.000.
Wemhoff, Gregory A.: *See*—
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Weng, Lih-Jyh, to Digital Equipment Corporation. Data encoding and demodulation system. 5,184,125, Cl. 341-59.000.
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Werthmann, Wilfried, to Standex International GmbH. Method for making a continous metal band having surface impressions. 5,183,551, Cl. 205-70.000.
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Hurtado, Larry; Curto, Rick A.; and Martin, Dallas, 5,183,966, Cl. 474-20.000.
Minette, Daniel C., 5,182,955, Cl. 73-865.600.
Western Rock Bit Company Limited: *See*—
White, Kenneth M., 5,183,123, Cl. 175-228.000.
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Collet, Erwin; Rathgeber, Roland; and Jerxsen, Udo, 5,182,869, Cl. 34-20.000.
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Amos, Dennis R., 5,183,390, Cl. 416-224.000.
Jackovitz, John F.; Kunkle, Richard P.; and Peterson, Steven H., 5,183,542, Cl. 204-180.100.
Snyder, Thomas S.; Gass, William R.; Worcester, Samuel A.; Ayers, Laura J.; and Boris, Gregory F., 5,183,541, Cl. 204-105.00R.
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Millay, George D.; and Powell, John D., 5,183,437, Cl. 472-117.000.
Wettermann, Peter H., to International Medical, Inc. Laparoscopic cholangiogram catheter and method of using same. 5,183,470, Cl. 604-281.000.
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Norlander, Norman E.; and Thompson, Ralph A., 5,183,089, Cl. 144-231.000.
Wheeler, Dale K., to Black & Decker Inc. Method for assembling a stator subassembly. 5,182,848, Cl. 29-596.000.
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Wright, William R.; and Lehman, Dexter, 5,182,834, Cl. 15-330.000.
White, Kenneth M., to Western Rock Bit Company Limited. Indicating means for a rock bit lubricating system. 5,183,123, Cl. 175-228.000.
Whyatt, Greg A.: *See*—
Treat, Russell L.; Gee, Glendon W.; and Whyatt, Greg A., 5,183,355, Cl. 405-128.000.
Wickersheim, Kenneth A.; and Adams, Bruce E., to Luxtron Corporation. Temperature measurement with combined photo-luminescent and black body sensing techniques. 5,183,338, Cl. 374-131.000.
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Conrads, Norbert; Schiebel, Ulrich; and Wieczorek, Herfried, 5,184,018, Cl. 250-370.090.
Wiegand, Karl E.; and Hu, Patrick C., to Ethyl Corporation. Silicon compounds in bone treatment. 5,183,061, Cl. 128-897.000.
Wiegel, Dave C.; Bradshaw, Dan A.; and Petravicius, Stasys, to Hughes Aircraft Company. Heel grounding device. 5,184,275, Cl. 361-223.000.
Wierman, Michael J.; and Olsson, Lennart F., to Frigoscandia Food Process Systems AB. Belt conveyor system. 5,183,149, Cl. 198-778.000.
Wiesel, Martin: *See*—
Bruckner, Raimund; Hintzen, Ullrich; Lee, Steve; Schuler, Andreas; and Wiesel, Martin, 5,183,624, Cl. 266-236.000.
Wilcox, Robert. Revolving peanut roasting apparatus. 5,182,981, Cl. 99-333.000.
Wild, Richard: *See*—
Wanninger, Paul; Wild, Richard; Kleinschmidt, Ernst; and Spath, Helmut, 5,183,520, Cl. 149-19.910.
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Robar, Sheldon C.; Fraser, David W.; and Wiley, Bernard A., 5,182,913, Cl. 60-671.000.
Wilhelm, Richard D.; and Adonakis, Nikolaos A., to General Motors Corporation. Gas pulsation attenuator for automotive air conditioning compressor. 5,183,974, Cl. 181-0.500.
Wilhite, Gerald D., to Jokari/US., Inc. Self-closing bag holder. 5,183,227, Cl. 248-99.000.
Wilk, Peter J. Surgical instrument assembly and apparatus and surgical method. 5,183,033, Cl. 128-20.000.
Wilk, Peter J. Laparoscopic cannula. 5,183,471, Cl. 604-284.000.
Williams, David J.: *See*—
Schildkraut, Jay S.; Young, Ralph H.; Williams, David J.; and Scozzafava, Michael, 5,184,323, Cl. 365-124.000.
Williams, David S., to Boart International, Limited. Button sharpening. 5,182,971, Cl. 76-5.100.
Williams, Fred E., Jr.: *See*—
Ranalletta, Joseph V.; Williams, Fred E., Jr.; and Kanner, Rowland W., 5,183,184, Cl. 222-189.000.
Williams, Richard A.: *See*—
Kline, John F.; Pensavecchia, Frank G.; LaPonsey, Stephen M.; and Williams, Richard A., 5,182,990, Cl. 101-211.000.
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Samuel, David N.; and Williams, Richard S., 5,183,848, Cl. 525-57.000.
Williams, Robert; Sirvet, Enn; and Gabel, Richard A., to Sequa Corporation. Apparatus and method for automatically positioning valve

means controlling the application of pressurized air to mandrels on a rotating carrier. 5,183,145, Cl. 198-441.000.

Williams, Thomas W.: *See*—
Connolly, Jerome J.; Barrick, Michael D.; D'Agostino, William L.; Thomas, Gerald F.; and Williams, Thomas W., 5,184,141, Cl. 343-705.000.

Williams, Willard J. Bag and adjustable bag opener frame. 5,183,339, Cl. 383-33.000.

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Alvarez, Robert J.; Bredesen, Scott E.; Wilson, James J.; Flim, Duane D.; Kniffen, Todd E.; and Schahrer, Clinton O., 5,182,925, Cl. 62-347.000.

Wilson, Wendell G.: *See*—
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Asmussen, Erik; Munksgaard, Erik C.; Muller, Michael; Podszun, Wolfgang; and Winkel, Jens, 5,183,832, Cl. 522-84.000.

Winner, James E.: *See*—
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Winslow, Peter S.: *See*—
Burchill, Gary W.; Gillett, Frank E.; Ramaswamy, Rajan; and Winslow, Peter S., 5,182,877, Cl. 43-54.100.

Winternitz, Paul: *See*—
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Winzen International, Inc.: *See*—
Rai, Kula R.; Lew, Thomas M.; and Sinclair, Robert B., 5,184,190, Cl. 356-239.000.

Wirth, Herbert: *See*—
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Triplett, Eric W., 5,183,759, Cl. 435-252.200.

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Anthony, James R.; and Wiseman, Michael A., 5,182,837, Cl. 24-642.000.

Wishneski, Todd W.; and Margitich, Donald E., to BASF Corporation. Catalysts for extending the shelf life of formulations for producing rigid polyurethane foams. 5,183,583, Cl. 252-182.240.

Wittkopp, Connell A., to Peerless Saw Company, The. Spring beamed shock absorbing circular saw blade body. 5,182,976, Cl. 83-835.000.

Wizani, Wolfgang; Esterbauer, Hermann; Steiner, Walter; and Gomes, Joseph, to Voest-Alpine Industrienlagenbau Gesellschaft m.b.H. Preparation of xylanase by cultivating *Thermomyces lanuginosus* DSM 5826 in a medium containing corn cobs. 5,183,753, Cl. 435-201.000.

Wolber, Jack; Lord, Steve; and Froehling, Dieter, to Eastman Kodak Company. Vaccum drum for different sized media. 5,183,252, Cl. 271-276.000.

Wolf, Michael A.: *See*—
MacArthur, Duncan W.; Wolf, Michael A.; McAtee, James L.; Unruh, Wesley P.; Cucchiara, Alfred L.; and Huchton, Roger L., 5,184,019, Cl. 250-380.000.

Wolf, Robert L.: *See*—
Jordan, Scott C.; Wolf, Robert L.; Fleege, Dennis W.; and Sharp, Jeffrey O., 5,184,278, Cl. 361-346.000.

Wolfe, John R., Jr.: *See*—
Frank, Jimmy L.; Wolfe, John R., Jr.; and Douglas, James R., 5,182,862, Cl. 33-199.00R.

Wolfert, Anthony J., to Shell Research Limited. Process for preparing magnesia having reduced hydration tendency, hydration resistant magnesia, dry mixture for preparing magnesia based castables and magnesia based castable. 5,183,648, Cl. 423-267.000.

Womersley, Christopher: *See*—
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Wong, Henry; Quates, Ronald D.; and Chen, Lien-Yan, to FMC Corporation. Metal-to-metal wellhead seal for rough casing. 5,183,268, Cl. 277-27.000.

Wood, Michael I.: *See*—
Kerry, Stephen; Restall, James E., deceased; and Wood, Michael I., 5,183,635, Cl. 420-420.000.

Wood, Michael R.; Bair, Keith A.; Chen, Fu; and Vasconcellos, Stephen R., to Betz Laboratories, Inc. Cationic polymers for sludge dewatering. 5,183,576, Cl. 210-734.000.

Woodall, Bobbie L.; Nichols, Charles R.; and Nichols, Thelma E. Protective boot. 5,182,956, Cl. 74-18.200.

Woodson, Herbert H.: *See*—
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Woodward, Keile J. Hearth comforter. 5,183,030, Cl. 126-500.000.

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Wouters, Wouter: *See*—
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Wright, Graham L., to Thorn Emi plc. Apparatus for projecting light onto a surface having reflector means for improving the brightness of the image. 5,184,238, Cl. 359-70.000.

Wright, Raymond E.: *See*—
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Wright, Roger G.; Lindbloom, Leon J.; and Midlam, Lewis C., to SCM Consultants, Inc. Process for in situ recycling of electrical power distribution switchyard aggregate surfacing. 5,183,354, Cl. 404-81.000.

Wright, Scott M.; and Wright, Raymond E. Optical attenuator movement detection system. 5,184,009, Cl. 250-227.110.

Wright, William R.; and Lehman, Dexter, to White Consolidated Industries, Inc. Vacuum pump-out control valve for wet/dry vacuum cleaner. 5,182,834, Cl. 15-330.000.

Wu, Ching-Hsong: *See*—
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Wu, William: *See*—
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Wynn, Robert L.: *See*—
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Xanthakos, Dimitrios; and Sevastakis, Gus. Apparatus for supporting and moving needles and trocars for penetrating the abdomen. 5,183,465, Cl. 604-108.000.

Xerox Corporation: *See*—
Cianciosi, Michael S., 5,184,226, Cl. 358-296.000.
Hubbie, Fred F., III; Mitchell, John M., Jr.; and Martin, James P., 5,184,011, Cl. 250-231.140.
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Y.M. Golf Course Equipment Co., Ltd.: *See*—
Watanabe, Hayataro, 5,183,120, Cl. 172-21.000.

Yada, Toshio: *See*—
Tsutsumi, Michinari; Endo, Atsushi; and Yada, Toshio, 5,183,533, Cl. 156-656.000.

Yagi, Noboru: *See*—
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Yagi, Sakai: *See*—
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Yagi, Shigeru; Fukuda, Yuzuru; Higashi, Taketoshi; and Yokoi, Masaki, to Fuji Xerox Co., Ltd. Electrophotographic material having an amorphous silicon photoconductive layer, an intermediate layer and a surface layer. 5,183,719, Cl. 430-66.000.

Yagi, Toshihiko, to Konica Corporation. Silver halide photographic light-sensitive material improved in gradation, processing stability and other properties. 5,183,730, Cl. 430-503.000.

Yagyu, Masayoshi: *See*—
Masuda, Noboru; Kamikawai, Ryotaro; Yagyu, Masayoshi; Yamamoto, Masakazu; Itoh, Hiroyuki; and Saito, Tatsuya, 5,184,027, Cl. 307-269.000.

Yamada, Hironori: *See*—
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Yamada, Kenzo: *See*—
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Yamada, Kiichi: *See*—
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Yamada, Masakatsu: *See*—
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Yamada, Minoru: *See*—
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Sasaki, Ichiro; Oshima, Junji; and Yamada, Minoru, 5,183,859, Cl. 525-309.000.

Yamada, Yoshihiko: *See*—
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Yamadai, Tsutomu: *See*—
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Yamaguchi, Akira; Uno, Masaru; Sekikawa, Norio; Arai, Fumio; and Matsuzaki, Kenji, to Sumitomo Seika Chemicals Co., Ltd. Process for removal of water in raw material mixed gas. 5,183,484, Cl. 55-34.000.

Yamaguchi, Seiji; Moro, Masaru; Kajikawa, Saburou; Kimura, Masahiro; Okubo, Hideo; Matsuyo, Tadashi; and Kawakami, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 5,182,833, Cl. 15-319.000.

Yamaguchi, Soichiro; Matsuda, Koichi; and Goto, Hideo, to Ube Cycon, Ltd. Polyphenylene ether composition. 5,183,849, Cl. 525-68.000.

Yamaguchi, Toshiaki: *See*—
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Yamaha Corporation: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamamoto, Kazumi; and Sugasawa, Masayuki, to Ikegami Tsushinki Co., Ltd. Circuit for producing brightness signal from output signal of solid state image pick-up apparatus using spatial pixel shift. 5,184,212, Cl. 358-39.000.

Yamamoto, Koichi: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; Yamamoto, Koichi; and Kato, Tohru, 5,183,637, Cl. 420-479.000.

Yamamoto, Masahiro: *See*—
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Yamamoto, Masakazu: *See*—
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Yamamoto, Masao: *See*—
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Yamamoto, Mitsunori, to Olympus Optical Co., Ltd. Optical scanning apparatus with axis deviation correction. 5,184,012, Cl. 250-234.000.

Yamamoto, Reijko: *See*—
Tanaka, Hiroshi; Kominato, Kaichiro; Yoshioka, Takeo; Iguchi, Hiroshi; Hirano, Shin-ichi; Okajima, Yasuo; Yamamoto, Reijko; Shirai, Masataka; Nishida, Hiroshi; Tone, Hiroshi; and Okamoto, Rokuro, 5,183,883, Cl. 563-6.400.

Yamanashi, Makoto; Jinno, Keishi; Watanabe, Tamio; Endo, Takayoshi; and Yagi, Sakai, to Yazaki Corporation. Connector. 5,183,418, Cl. 439-752.000.

Yamanobe, Masato, to Canon Kabushiki Kaisha. Thin film semiconductor device with particular grain size. 5,184,200, Cl. 257-53.000.

Yamasa Shoyu Co., Ltd.: *See*—
Sakata, Shinji; Miyashita, Takanori; Kondo, Kazuhiko; Sakai, Atsushi; Shibata, Toshiyuki; and Ogawa, Takayuki, 5,183,882, Cl. 514-49.000.

Yamasaki, Haruki: *See*—
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Yamasaki, Komei; and Keisuke, Funaki, to Idemitsu Kosan Co., Ltd. Styrene polymer molding material and process for preparing same. 5,183,871, Cl. 526-347.200.

Yamasaki, Yoshikiyo; and Fujimoto, Shinichiro, to Kabushiki Kaisha Japan Health; and Kabushiki Kaisha Fuji Iryoki. Portable vibration finger pressure massager. 5,183,034, Cl. 128-36.000.

Yamashiro, Patsy K. Unidirectional fluid flow resisted exercise device with inertial and elastic mechanical loading. 5,183,453, Cl. 482-112.000.

Yamashita, Kohei: *See*—
Kaneko, Masahiro; Takemura, Masashi; and Yamashita, Kohei, 5,184,254, Cl. 360-10.200.

Yamashita, Masataka: *See*—
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Yamashita, Ryuzo. Apparatus for measuring car frame. 5,182,864, Cl. 33-288.000.

Yamashita, Shuji, to NEC Corporation. Supervisory circuit for optical repeater. 5,184,242, Cl. 359-177.000.

Yamashita, Tetsuya: *See*—
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Yamazaki, Fumio: *See*—
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Yamazaki, Iwao: *See*—
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Yamazaki, Shumpei, to Semiconductor Energy Laboratory Co., Ltd. Diamond film deposition by ECR CVD using a catalyst gas. 5,183,685, Cl. 427-571.000.

Yamazaki, Shunpei; Hayashi, Shigenori; Inujima, Takashi; and Hirose, Naoki, to Semiconductor Energy Laboratory Co., Ltd. Photo CVD apparatus with a glow discharge system. 5,183,511, Cl. 118-723.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method of manufacturing diamond thermistors. 5,183,530, Cl. 156-643.000.

Yan, Wen-Jyh, to Industrial Technology Research Institute. Solar dehumidifier. 5,182,921, Cl. 62-235.100.

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Yanagisawa, Ryogo, to Matsushita Electric Industrial Co., Ltd. Wipe generator having start position and width controller. 5,184,222, Cl. 358-183.000.

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Yasumura, Takaaki; Kiyomiya, Teruo; Mizuno, Yasutoshi; and Matsui, Kazuo, to Fuji Electrochemical Co., Ltd. Permanent magnet composition. 5,183,517, Cl. 148-303.000.

Yatsuka, Takeshi: *See*—
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Zakaryan, Ara H.; Newallis, Peter E.; and Tice, Mark A., to Miles Inc. Process for producing tri-N-butylphosphorotrithioite. 5,183,916, Cl. 558-95.000.
Zakheim, Howard; Clinton, Peter M.; Goldschneider, James D.; Kasmer, Christopher A.; Zahn, Markus; and Hoffmeyer, Charles L., to Du Pont de Nemours, E. I., and Company. Process of magnetic media milling. 5,183,214, Cl. 241-30.000.
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Zoller, Robert A., to Standard Products Company, The. Decorative trim attaching method. 5,183,303, Cl. 293-120.000.
Zuccaro, Dante C.: *See*—
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Zushi, Takayasu, to Takata Corporation. Molding method of air bag cover. 5,183,615, Cl. 264-219.000.
3D Systems, Inc.: *See*—
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LIST OF REISSUE PATENTEES

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Gwinn, J. S.; and Miller, Michael J., to Phillips Petroleum Company. Continuous mixer. Re. 34,172, Cl. 366-85.000.

Kerber, Susan M., to Midwest Research Technologies, Inc. Multi-layer wear resistant coatings. Re. 34,173, Cl. 428-610.000.

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Phillips Petroleum Company: *See*—
Gwinn, J. S.; and Miller, Michael J., Re. 34,172, Cl. 366-85.000.

Romick, Jerome M.; and Beardsley, Duane. Medication carts and cassettes. Re. 34,171, Cl. 312-257.100.

Stahlecker, Fritz; and Stahlecker, Hans. Spinning unit piecing process for producing feed spools. Re. 34,170, Cl. 57-261.000.

Stahlecker, Hans: *See*—
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Fujitsu Limited: *See*—
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Fujitsu Microcomputer Systems Limited: *See*—
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Hida, Hidenori: *See*—
Iino, Hideyuki; and Hida, Hidenori, B1 4,904,883, Cl. 307-272.300.

Iino, Hideyuki; and Hida, Hidenori, to Fujitsu Limited; and Fujitsu Microcomputer Systems Limited. Semiconductor integrated circuit having a DC test function. B1 4,904,883, 2-2-93, Cl. 307-272.300.

Jarrett, Charles C., to Nutri-Fruit, Inc. Beverage dispensing system. B1 5,056,686, 2-2-93, Cl. 222-129.200.

Kamprath, Karl-Heinz, to Braun Aktiengesellschaft. Portable mixer for processing food. B1 4,922,464, 2-2-93, Cl. 366-349.000.

Le, Quynh-Giao X.: *See*—
Sanwo, Ikuo J.; Milby, Gregory H.; and Le, Quynh-Giao X., B1 5,030,857, Cl. 307-475.000.

Milby, Gregory H.: *See*—
Sanwo, Ikuo J.; Milby, Gregory H.; and Le, Quynh-Giao X., B1 5,030,857, Cl. 307-475.000.

NCR Corporation: *See*—
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Jarrett, Charles C., B1 5,056,686, Cl. 222-129.200.

Sanshin Kogyo Kabushiki Kaisha: *See*—
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Sanwo, Ikuo J.; Milby, Gregory H.; and Le, Quynh-Giao X., to NCR Corporation. High speed digital computer data transfer system having reduced bus state transition time. B1 5,030,857, 2-2-93, Cl. 307-475.000.

Shibata, Yasuhiko, to Sanshin Kogyo Kabushiki Kaisha. Cooling system for four stroke outboard motor. B1 5,036,804, 2-2-93, Cl. 123-41.740.

LIST OF PLANT PATENTEES

California Florida Plant Co., L.P.: *See*—
Jessel, Walter H., Jr., 8,122, Cl. 70.500.
Jessel, Walter H., Jr., 8,123, Cl. 72.100.

Fell, David. Spathiphyllum 'Leprechaun' . 8,130, 2-2-93, Cl. 88.100.

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Fruehwirth, Franz, to Paul Ecke Ranch, Inc. Poinsettia plant named 268 White. 8,125, 2-2-93, Cl. 86.200.

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Georgusis, James J., to Oglesby Plant Laboratories, Inc. Anthurium plant 'Georgusis White Number 1'. 8,129, 2-2-93, Cl. 88.100.

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Holtkamp, Reinhold, Sr. African violet plant named Vienna. 8,120, 2-2-93, Cl. 69.200.

Holtkamp, Reinhold, Sr. African violet plant named Little Azurite. 8,121, 2-2-93, Cl. 69.200.

Jessel, Walter H., Jr., to California Florida Plant Co., L.P. Carnation plant named CFPC Amethyst. 8,122, 2-2-93, Cl. 70.500.

Jessel, Walter H., Jr., to California Florida Plant Co., L.P. Carnation plant named CFPC Cherie. 8,123, 2-2-93, Cl. 72.100.

Man, Jan. Poinsettia plant 'Goldfinger'. 8,127, 2-2-93, Cl. 86.400.

Oglesby Plant Laboratories, Inc.: *See*—
Georgusis, James J., 8,129, Cl. 88.100.
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Trees, Scott C., to Geo. I. Ball, Inc. Variety of Geranium named Hot Pink Satisfaction. 8,128, 2-2-93, Cl. 87.120.

van der Knapp, Jacques C. M., to Fides Beheer B.V. Chrysanthemum plant — Bayfrank cultivar. 8,124, 2-2-93, Cl. 82.400.

LIST OF STATUTORY INVENTION REGISTRATIONS

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Adkins, James Y.: *See*—
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Berggren, Mark A.: *See*—
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Bloom, Ira D.; Poeppel, Roger B.; and Flandermeyer, Brian K., to United States of America, Energy. Processing method for superconducting ceramics. H1138, 2-2-93, Cl. 505-1.000.

Bridges, William P.; Adkins, James Y.; and Leas, Steven W., to United States of America, Air Force. Aircraft arresting system and method. H1133, 2-2-93, Cl. 244-110.00C.

Caldwell, Gordon A.: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
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Easter, William G.; and Shanaman, Richard H., III, to American Telephone and Telegraph Company. Wafer bonding technique for dielectric isolation processing. H1137, 2-2-93, Cl. 437-62.000.

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Bloom, Ira D.; Poeppel, Roger B.; and Flandermeyer, Brian K., H1138, Cl. 505-1.000.

Gelles, Richard; and Berggren, Mark A., to Shell Oil Company. Asphalt-block copolymer roofing composition. H1141, 2-2-93, Cl. 524-68.000.

Greenwood, Stewart H.; and Caldwell, Gordon A. Asbestos free adhesive insulation. H1140, 2-2-93, Cl. 523-180.000.

Grover, Gary J., to E. R. Squibb & Sons, Inc. Combination of a calcium channel blocker and thromboxane A_2 receptor antagonist or synthetase inhibitor and method for treating ischemia employing such combination. H1139, 2-2-93, Cl. 514-211.000.

Janikowski, Stuart K., to United States of America, Air Force. Electrolytic deposition and recovery of silver. H1136, 2-2-93, Cl. 205-263.000.

Johnson, Thomas H., to Shell Oil Company. Reduction of residual organic chlorine in hydrocarbyl amines. H1143, 2-2-93, Cl. 564-498.000.

Leas, Steven W.: *See*—
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Meadows, Donald H.; and Crusco, Vincent J., to United States of America, Navy. Aircraft fire-fighting training apparatus. H1134, 2-2-93, Cl. 434-226.000.

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Bloom, Ira D.; Poeppel, Roger B.; and Flandermeyer, Brian K., H1138, Cl. 505-1.000.

Schwartz, Vernon R. Toner application and circulation apparatus. H1135, 2-2-93, Cl. 118-689.000.

Shanaman, Richard H., III: *See*—
Easter, William G.; and Shanaman, Richard H., III, H1137, Cl. 437-62.000.

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Johnson, Thomas H., H1143, Cl. 564-498.000.

Slusarchyk, William A.; and Zahler, Robert. Optically active cyclobutyl pyrimidine. H1142, 2-2-93, Cl. 544-314.000.

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Slusarchyk, William A.; and Zahler, Robert, H1142, Cl. 544-314.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 2, 1993

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

79	5,182,812
104	5,182,813
161 A	5,182,814
406	5,182,815
424	5,182,816
439	5,182,817

CLASS 4

235	5,182,818
393	5,182,819
541.4	5,182,820
592	5,182,821
625	5,182,822
661	5,182,823

CLASS 5

2.1	5,182,824
451	5,182,825
453	5,182,826
498	5,182,827
631	5,182,828

CLASS 7

166	5,182,829

CLASS 8

110	5,183,473
471	5,183,474

CLASS 15

78	5,182,830
250.42	5,182,831
304	5,182,832
319	5,182,833
330	5,182,834

CLASS 19

296	5,182,835

CLASS 24

633	5,182,836
642	5,182,837
712.7	5,182,838

CLASS 28

283	5,182,839

CLASS 29

229	5,182,841
240	5,182,842
445	5,182,843
469	5,182,844
	5,182,845
527.2	5,182,846
527.7	5,182,847
596	5,182,848
600	5,182,849
784	5,182,850
827	5,182,851
840	5,182,852
841	5,182,853
883.061	5,182,854
889.22	5,182,855
890.039	5,182,856

CLASS 30

34.05	5,182,857
85	5,182,858
90.6	5,182,859
325	5,182,860

CLASS 33

18.1	5,182,861
199 R	5,182,862
227	5,182,863
288	5,182,864
350	5,182,865
645	5,182,866
702	5,182,867

CLASS 34

18	5,182,868
20	5,182,869
26	5,182,870
54	5,182,871

CLASS 40

152	5,182,872

CLASS 42

1.01	5,183,951
71.02	5,183,952
96	5,183,953

CLASS 43

17	5,182,873
25	5,182,874
42.24	5,182,875
42.39	5,182,876
54.1	5,182,877
57.1	5,182,878
131	5,182,879

CLASS 44

343	5,183,475
445	5,183,476

CLASS 47

58	5,183,477

CLASS 48

197 R	5,183,478

CLASS 49

504	5,182,880

CLASS 51

7	5,182,881
293	5,183,479
317	5,182,882

CLASS 52

73	5,182,883
79.14	5,182,884
98	5,182,885
125.6	5,182,886
167 DF	5,182,888
167 R	5,182,887
298	5,182,889
410	5,182,890
480	5,182,891
539	5,182,892
745.05	5,182,893

CLASS 53

399	5,182,894
469	5,182,895
478	5,182,896
520	5,182,897
570	5,182,898

CLASS 55

12	5,183,480
15	5,183,481
16	5,183,482
26	5,183,483
34	5,183,484
159	5,183,486
289	5,183,487
320	5,183,488

CLASS 56

400.17	5,182,899

CLASS 57

22	5,182,900
135	5,182,901
261	Re.34,170
279	5,182,902
301	5,182,903

CLASS 60

39.161	5,182,904
204	5,182,905
226.1	5,182,906
276	5,182,907
420	5,182,908
426	5,182,909
529	5,182,910
533	5,182,911
641.8	5,182,912
671	5,182,913

CLASS 62

3.1	5,182,914
89	5,182,915
135	5,182,916
137	5,182,917
149	5,182,918
193	5,182,919
206	5,182,920
235.1	5,182,921
239	5,182,922
249	5,182,923
255	5,182,924
347	5,182,925
352	5,182,926

CLASS 65

4.2	5,183,489
144	5,183,490
351	5,183,491

CLASS 66

54	5,182,927

CLASS 70

232	5,182,928
337	5,182,929

CLASS 72

138	5,182,930
183	5,182,931
217	5,182,932
335	5,182,933
405	5,182,934
417	5,182,935
420	5,182,936
469	5,182,937

CLASS 73

19.05	5,182,938
29.01	5,182,939
36	5,182,940
40	5,182,941
61.46	5,182,942
116	5,182,943
117.1	5,182,944
118.1	5,182,945
151	5,182,946
304 C	5,182,947
429	5,182,948
517 B	5,182,949
811	5,182,950
861	5,182,951
861.79	5,182,952
862.335	5,182,953
864.45	5,182,954
865.6	5,182,955

CLASS 74

18.2	5,182,956
42	5,182,957
84 R	5,182,958
411.5	5,182,959
417	5,182,960
471 XY	5,182,961
473 R	5,182,962
512	5,182,963
523	5,182,964
543	5,182,965
606 R	5,182,966
834	5,182,967
856	5,182,968
866	5,182,969
	5,182,970

CLASS 75

335	5,183,493
349	5,183,494
379	5,183,495
702	5,183,496
	5,183,497
709	5,183,498
742	5,183,499

CLASS 76

5.1	5,182,971

CLASS 81

44	5,182,972
429	5,182,973

CLASS 82

124	5,182,974

CLASS 83

745	5,182,975
835	5,182,976

CLASS 84

385 P	5,183,954
437	5,183,955

CLASS 89

8	5,183,956
	5,183,957
16	5,183,958
148	5,183,959

CLASS 91

197	5,182,977
499	5,182,978

CLASS 92

5 R	5,182,979
5.00 R	5,182,980

CLASS 99

333	5,182,981
404	5,182,982
486	5,182,983
509	5,182,984

CLASS 100

35	5,182,985
41	5,182,986
87	5,182,987
98 R	5,182,988

CLASS 101

148	5,182,989
211	5,182,990
216	5,182,991
363	5,182,992
365	5,182,993
415.1	5,182,994

CLASS 102

348	5,183,960
439	5,183,961
489	5,183,962
515	5,183,963

CLASS 104

2	5,182,995

CLASS 106

1.22	5,183,500
22 D	5,183,501
22 K	5,183,502
38.51	5,183,503
404	5,183,504
672	5,183,505
739	5,183,506

CLASS 108

64	5,182,996

CLASS 112

80.73	5,182,997
117	5,182,998
178	5,182,999

CLASS 114

222	5,183,000
266	5,183,001
353	5,183,002

CLASS 116

26	5,183,003

CLASS 118

18	5,183,507
653	5,183,964
683	5,183,508
696	5,183,509
719	5,183,510
723	5,183,511

CLASS 119

5	5,183,004
52.2	5,183,005
85	5,183,006
96	5,183,007
155	5,183,008
165	5,183,009
172	5,183,010

CLASS 123

1 A	5,183,011
41.08	5,183,012
41.74	B1 5,036,804
48 R	5,183,013
59 AC	5,183,014
90.16	5,183,015
90.55	5,183,016
198 D	5,183,017
321	5,183,018
339	5,183,019
406	5,183,020
478	5,183,021
520	5,183,022
	5,183,023
598	5,183,024
669	5,183,025

CLASS 125

11.16	5,183,026

CLASS 126

25 R	5,183,027
73	5,183,028
362	5,183,029
500	5,183,030

CLASS 128

3	5,183,464
6	5,183,031
20	5,183,032
	5,183,033
36	5,183,034
66	5,183,035
204.18	5,183,037
204.21	5,183,038
400	5,183,039
419 PG	5,183,040
421	5,183,041
633	5,183,042
642	5,183,043
648	5,183,044
653.2	5,183,045
661.07	5,183,046
661.09	5,183,047
662.06	5,183,048
663.01	5,183,049
687	5,183,050
	5,183,051
753	5,183,052
754	5,183,053
	5,183,054
774	5,183,055
782	5,183,056
845	5,183,057
847	5,183,058
858	5,183,059
882	5,183,060
897	5,183,061

CLASS 131

194	5,183,062

CLASS 132

321	5,183,063
323	5,183,064
	5,183,065

CLASS 134

1	5,183,512
22.12	5,183,513
38	5,183,514
54	5,183,066
61	5,183,067

CLASS 137

1	5,183,068
15	5,183,069
75	5,183,070
106	5,183,071
113	5,183,072
385	5,183,073
488	5,183,074
493.6	5,183,075
513.7	5,183,076
625.47	5,183,077
883	5 183,078

CLASS 138

110	5,183,079

CLASS 139

55.1	5,183,080
59	5,183,081
92	5,183,082
449	5,183,083
	5,183,084

CLASS 140

89	5,183,085

CLASS 141

10	5,183,086
59	5,183,087

CLASS 144

2 J	5,183,088
231	5,183,089
350	5,183,090
360	5,183,091

CLASS 148

101	5,183,515
302	5,183,516
303	5,183,517
324	5,183,518
582	5,183,519

CLASS 149

19.91	5,183,520

CLASS 156

142	5,183,521
244.13	5,183,522
367	5,183,523
423	5,183,524
470	5,183,525
555	5,183,527
556	5,183,526
601	5,183,528
613	5,183,529
643	5,183,530
	5,183,531
656	5,183,533
668	5,183,534

CLASS 160

84.1	5,183,092
	5,183,093
370.2	5,183,094

CLASS 162

19	5,183,535
57	5,183,536
216	5,183,537

CLASS 164

34	5,183,095
97	5,183,096
306	5,183,097

CLASS 165

8	5,183,098
41	5,183,099
45	5,183,100
47	5,183,101
48.1	5,183,102
104.33	5,183,104
140	5,183,105
166	5,183,106
167	5,183,103
176	5,183,107

CLASS 166

187	5,183,108
250	5,183,109
278	5,183,110
298	5,183,111
312	5,183,112
316	5,183,113
319	5,183,114
	5,183,115

CLASS 169

43	5,183,116
46	5,183,117

CLASS 171

16	5,183,118
105	5,183,119

CLASS 172

21	5,183,120

CLASS 173

206	5,183,121

CLASS 174

15.5	5,183,965
52.1	5,183,967
88 R	5,183,969
125.1	5,183,970
138 F	5,183,971
251	5,183,972
254	5,183,973

CLASS 175

52	5,183,122
228	5,183,123

CLASS 177

210 FP	5,183,124
211	5,183,125
	5,183,126

CLASS 180

197	5,183,127

5,183,128
208 5,183,129
219 5,183,130
233 5,183,131
247 5,183,132
252 5,183,133

CLASS 181

0.5 5,183,974
202 5,183,975
264 5,183,976
266 5,183,977

CLASS 184

6.16 5,183,134

CLASS 186

61 5,183,135

CLASS 187

105 5,183,978
108 5,183,979
112 5,183,980
128 5,183,981

CLASS 188

73.44 5,183,136
381 5,183,137

CLASS 192

4 C 5,183,138
45 5,183,139
56 R 5,183,140
91 A 5,183,141

CLASS 194

206 5,183,142

CLASS 198

370 5,183,143
382 5,183,144
441 5,183,145
444 5,183,146
524 5,183,147
674 5,183,148
778 5,183,149
782 5,183,150
803.01 5,183,151

CLASS 200

61.85 5,183,982
81.9 M 5,183,983

CLASS 203

28 5,183,538
38 5,183,539
41 5,183,540

CLASS 204

105 R 5,183,541
180.1 5,183,542
242 5,183,543
252 5,183,544
5,183,545
290 R 5,183,546
298.25 5,183,547
299 R 5,183,548
415 5,183,549
5,183,550

CLASS 205

70 5,183,551
158 5,183,552
162 5,183,553

CLASS 206

232 5,183,153
315.9 5,183,154
320 5,183,155
366 5,183,156
390 5,183,157
524.4 5,183,152
554 5,183,158
583 5,183,159

CLASS 208

48 AA 5,183,554
5,183,555
57 5,183,556
111 5,183,557
113 5,183,558
119 5,183,559
236 5,183,560
251 R 5,183,561

CLASS 209

234 5,183,160
467 5,183,161

CLASS 210

85 5,183,562
180 5,183,563
232 5,183,564
269 5,183,565
321.75 5,183,567
321.8 5,183,566
360.1 5,183,568
636 5,183,569
641 5,183,570
649 5,183,571
650 5,183,572
697 5,183,573
701 5,183,574
724 5,183,575
734 5,183,576
761 5,183,577
773 5,183,578
776 5,183,579

CLASS 211

1.57 5,183,162
43 5,183,163
70.5 5,183,164
77 5,183,165
149 5,183,166
187 5,183,167

CLASS 212

232 5,183,168

CLASS 215

100 A 5,183,169

CLASS 219

10.55 M 5,183,984
10.61 R 5,183,985
69.12 5,183,986
5,183,987
69.17 5,183,988
121.14 5,183,989
121.54 5,183,990
121.64 5,183,991
5,183,992
121.82 5,183,993
387 5,183,994
433 5,183,995
452 5,183,996
464 5,183,997
492 5,183,998

CLASS 220

86.2 5,183,170
256 5,183,171
270 5,183,172
367 5,183,173
404 5,183,174
408 5,183,175
470 5,183,176
523 5,183,177
650 5,183,178
694 5,183,179
908 5,183,180

CLASS 221

155 5,183,181

CLASS 222

129 5,183,182
129.2 B1 5,056,686
175 5,183,183
189 5,183,184
209 5,183,185
211 5,183,186
287 5,183,187
383 5,183,188
397 5,183,189

CLASS 223

96 5,183,190
5,183,191

CLASS 224

42.21 5,183,192
219 5,183,193
224 5,183,194

CLASS 227

29 5,183,195
63 5,183,196

CLASS 228

160 5,183,197
186 5,183,198

CLASS 229

23 A 5,183,199
23 R 5,183,200
117.12 5,183,201
123 5,183,202
300 5,183,203

CLASS 235

379 5,183,999
5,184,000
449 5,184,001
454 5,184,002
5,184,003
462 5,184,004
472 5,184,005

CLASS 236

94 5,183,204

CLASS 239

222.13 5,183,205
317 5,183,206
394 5,183,322
526 5,183,207
542 5,183,208
585.1 5,183,209
703 5,183,210

CLASS 241

16 5,183,211
17 5,183,212
24 5,183,213
30 5,183,214
62 5,183,215
101.7 5,183,216

CLASS 242

47 5,183,217
54.00 R 5,183,218
68.1 5,183,219
85.1 5,183,220
310 5,183,221

CLASS 244

53 R 5,183,222
54 5,183,223
155 R 5,183,224
168 5,183,225

CLASS 248

97 5,183,226
99 5,183,227
100 5,183,228
102 5,183,229
118 5,183,230
156 5,183,231
220.2 5,183,232
343 5,183,233
430 5,183,234

CLASS 250

208.1 5,184,006
5,184,007
214 VT 5,184,008
227.11 5,184,009
227.21 5,184,010
231.14 5,184,011
234 5,184,012
236 5,184,013
237 G 5,184,014
282 5,184,015
288 5,184,016
343 5,184,017
370.09 5,184,018
380 5,184,019
455.11 5,184,020
560 5,184,021

CLASS 252

8.552 5,183,581
8.6 5,183,580
182.2 5,183,582
182.24 5,183,583
186.38 5,183,584
299.01 5,183,585
299.61 5,183,586
299.63 5,183,587
308 5,183,589
312 5,183,588
392 5,183,590
503 5,183,591
512 5,183,592
514 5,183,593
518 5,183,594
524 5,183,601
587 5,183,602

CLASS 254

8 B 5,183,235
95 5,183,236
134.4 5,183,237
209 5,183,238

CLASS 257

53 5,184,200
77 5,184,199
266 5,184,201
370 5,184,203
390 5,184,202
471 5,184,198
664 5,184,210
666 5,184,208
668 5,184,207
679 5,184,209
706 5,184,211
762 5,184,206
765 5,184,205

CLASS 261

64.3 5,183,595
93 5,183,596

CLASS 264

1.4 5,183,597
22 5,183,598
5,183,599
26 5,183,600
29.2 5,183,603
40.1 5,183,604
5,183,606
40.5 5,183,605
41 5,183,607
44 5,183,608
5,183,609
56 5,183,610
129 5,183,611
145 5,183,612
171 5,183,613
184 5,183,614
219 5,183,615
5,183,616
249 5,183,617
257 5,183,618
5,183,619
290.7 5,183,620
297.2 5,183,621
320 5,183,622
544 5,183,623

CLASS 266

236 5,183,624

CLASS 267

140.13 5,183,243

CLASS 269

43 5,183,244
254 R 5,183,245

CLASS 270

45 5,183,246
95 5,183,247

CLASS 271

3.1 5,183,239
5,183,240
12 5,183,241
14 5,183,242
127 5,183,248
186 5,183,249
222 5,183,250
276 5,183,251
5,183,252

CLASS 273

1.5 A 5,183,253
14 5,183,254
38 5,183,261
51 5,183,262
65 EG 5,183,263
67 A 5,183,264
73 C 5,183,265
73 J 5,183,260
88 5,183,266
167 G 5,183,255
241 5,183,256
243 5,183,257
252 5,183,258
418 5,183,259

CLASS 277

12 5,183,267
27 5,183,268
37 5,183,269
81 R 5,183,270
152 5,183,271
170 5,183,273

CLASS 279

62 5,183,274
156 5,183,272

CLASS 280

11.2 5,183,275
11.22 5,183,276
11.28 5,183,277
47.35 5,183,278
63 5,183,279
79.5 5,183,280
279 5,183,281
414.1 5,183,282
426 5,183,283
430 5,183,293
508 5,183,284
670 5,183,285
688 5,183,286
705 5,183,287
732 5,183,288
743 5,183,289
802 5,183,290
804 5,183,291
825 5,183,292

CLASS 281

23 5,183,294
29 5,183,295
46 5,183,296

CLASS 283

67 5,183,297

CLASS 285

12 5,183,298
47 5,183,299

CLASS 292

216 5,183,300
318 5,183,301
336.3 5,183,302

CLASS 293

120 5,183,303

CLASS 294

10 5,183,304
81.2 5,183,305

CLASS 295

11 5,183,306

CLASS 296

24.1 5,183,307
75 5,183,308
100 5,183,309
106 5,183,310

CLASS 297

151 5,183,311
250 5,183,312
344 5,183,313
440 5,183,314
488 5,183,315

CLASS 299

69 5,183,316

CLASS 303

113.2 5,183,317

CLASS 305

39 5,183,318

CLASS 307

10.2 5,184,022
10.3 5,184,023
10.8 5,184,024
66 5,184,025
139 5,184,026
269 5,184,027
270 5,184,028
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475 B1 5,030,857
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CLASS 310

26 5,184,037
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89 5,184,039
114 5,184,040
239 5,184,041
313 A 5,184,042
320 5,184,043

CLASS 312

196 5,183,319
229 5,183,320
250 5,183,321
257.1 Re.34,171

CLASS 313

638 5,184,044

CLASS 315

39.51 5,184,045
111.21 5,184,046

CLASS 318

280 5,184,048
362 5,184,049
467 5,184,050
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569 5,184,052
571 5,184,053
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615 5,184,055
799 5,184,056
803 5,184,057

CLASS 320

4 5,184,058
15 5,184,059

CLASS 322

99 5,184,060

CLASS 323

265 5,184,061

CLASS 324

74 5,184,062
86 5,184,063
156 5,184,064
158 F 5,184,068
158 P 5,184,065
158 R 5,184,066
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207.22 5,184,069
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321 5,184,078
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392 5,184,080
533 5,184,081
537 5,184,082
559 5,184,083
693 5,184,077

CLASS 328

15 5,184,084
65 5,184,085

CLASS 330

252 5,184,086
253 5,184,087
254 5,184,088
5,184,089
294 5,184,090

CLASS 331

10 5,184,091
16 5,184,092
25 5,184,093
158 5,184,094

CLASS 333

33 5,184,095
175 5,184,096
202 5,184,097
208 5,184,098

CLASS 335

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